The Northwestern MILLER

MILLING PRODUCTION SECTION

The Influence of the Latest Machinery Designs On Flour Mill Capacities and Production Costs

By Denys W. Povey

IN the last six years, great changes have taken place in the equipping of mills, the design of machinery and the layout of plant. Today new mills are being erected with, in some cases, less than half the total number of machines than was the case some few years ago and occupying less than half the building space hitherto necessary while producing equally satisfactory results.

In other cases, existing mills are carrying out remodels and obtaining considerable capacity increases within the same building, or reducing the space required by the milling plant in the mill building to allow the erection of additional flour bins in the space thus saved.

These great changes have been brought about by economic necessity. The capital investment to erect a new milling plant and mill buildings was too high, and the profit margins too low, to be considered a good investment. The same applied, to a lesser extent, to mill remodels. It is at all times necessary to remember that the best miller is the one who makes the most profit at the end of the year and not necessarily he who makes the best flour, although there is a very close relation between the two.

I would like to make it clear that the amount of roll, sifter and purifier surface necessary varies according to local conditions, the wheats being milled, moisture contents, type of flour required, extraction required and atmosphere humidity, but in all cases the same principle—that of making each machine do more work—applies.

Comparison of Mills

Before I go into detail I would like you to compare the flow sheet, machinery layout and building space required for a typical 120 ton mill, which I will refer to as Mill A, with that of a 120 ton mill that has been made possible with the successful introduction of high capacity machinery. This I will refer to as Mill B. (See Page 3a.)

- At present day prices the value of the mill machinery and all necessary equipment for Mill A would be approximately $490,000.*
- At present day prices the value of the mill, machinery and all the necessary equipment for Mill B would be approximately $268,800.
- At present day prices the value of the building necessary to house Mill A would be approximately $197,400.
- At present day prices the value of the building necessary to house Mill B would be approximately $67,760.

The cost of building has been computed at $22.55 per cubic meter.

The total saving would thus be approximately $350,840.

In all cases, I have ignored the wheat cleaning and conditioning department.

The capital cost is not the only saving. There are other savings, such as insurance, rates, labor and power which should be taken into account.

What changes in the design and construction of machines have enabled us to bring about these great economies?

Rollermills

Fifteen years ago, we at Rochdale realized that rollermills would be required to handle greater capacities than hitherto thought possible in Europe. How to achieve this without affecting the quality of the work was the problem.

First, it was necessary to ensure the machine itself was robustly constructed, well made, and the rolls themselves properly balanced, so that they could run at higher speeds. The machine was completely redesigned, and when I tell you that the Robinson rollermill 10 in. x 40 in. weighs 6,832 lb. you will have some ideas as to the strength and robustness of construction.

At the higher speeds that these machines might be expected to run, chains, as a substitute to gears, were provided, and for high capacities these are always to be recommended.

This part was relatively simple, but what would be the effect of these higher speeds on the work done? Experiments were started and it soon became clear that, in the case of break rolls, the secret lay in the specification of the corrugation and, in the case of Dunst rolls, there was a critical speed for each passage. Furthermore, it was necessary to adjust the periphery speed of the feed rolls to relate them to the periphery speed of the "slow" roll and also to ensure that the stock was fed right into the nip of the rolls. Once this was clear, it became a matter of collecting statistical data so that information was available to specify the ideal speeds and corrugating according to local conditions.

There is a very definite relationship between roll speeds and corrugation; if the speed of a pair of rolls is increased beyond a certain point, the best results cannot be obtained unless there is a compensating modification to the corrugation.

I would like to make it clear that there does come a time when, by reducing roll contact beyond certain limits, the resultant flour quality and/or extraction is affected and at this point the price of millfeed as compared to low grade flour has an important bearing as the balance must be struck between reduced capital and operating expenditure, and extraction.

At the higher speeds there is, naturally, more heating, but this is not a severe problem at all and in the case of the elevator mill with an adequate exhaust, and in all well designed pneumatic mills, this problem is well catered for.

Even where we have erected such mills in the tropics, we have never found it necessary to install water cooled rolls with their attendant complications and added costs.

I have been frequently asked whether the higher roll speeds and consequent heavier loadings require rollermills to be fitted with roller bearings, in place of plain bearings. The answer is that higher speeds will

(Charts on page 3a. Story continues on page 4a.)

About the Author

Mr. Povey is an executive of the British milling engineering firm of Thomas Robinson & Son, Ltd., Rochdale. This paper was delivered to the members of Den Norske Seksjon, Nordisk Cerealkjemierforening at Trondheim, Norway. Mr. Povey travels widely in the service of his firm and is well known to North American millers through his regular visits to the annual technical conferences of the Association of Operative Millers. He is highly regarded as a milling technologist and for some years supervised the education of many young millers throughout the world through a correspondence course with which he was associated.

• • •

Comparison of Machinery Requirements

	Mill A	Total Surface	Mill B	Total Surface
Rollermills	44—10 in. x 40 in.	3,520 in.	24—10 in. x 40 in.	1,920 in.
Plansifters	10—6 section 12 sieves deep	3,595 sq. ft.	4—6 section 24 sieves deep	1,355 sq. ft.
Purifiers	11—double 450mm sieves	220 sq. ft.	6—double tier double 450mm sieves	220 sq. ft.

*These estimates are based on European construction costs.

MICROSCOPICALLY . . . NO TWO ARE ALIKE

This is true of snowflakes . . . it is also true of flour granules.

Smooth quality flour must be sifted through a uniformly woven bolting cloth, such as SWISS SILK, but even with the maximum uniformity of aperture there is a wide variation in flour grain size. Some grains go through as a ball, some go through flat, some go through end-wise, so, to insure smooth, even texture for your product use the sifting cloth that comes as close to precise uniformity of aperture as it is possible to weave, use

★ ★

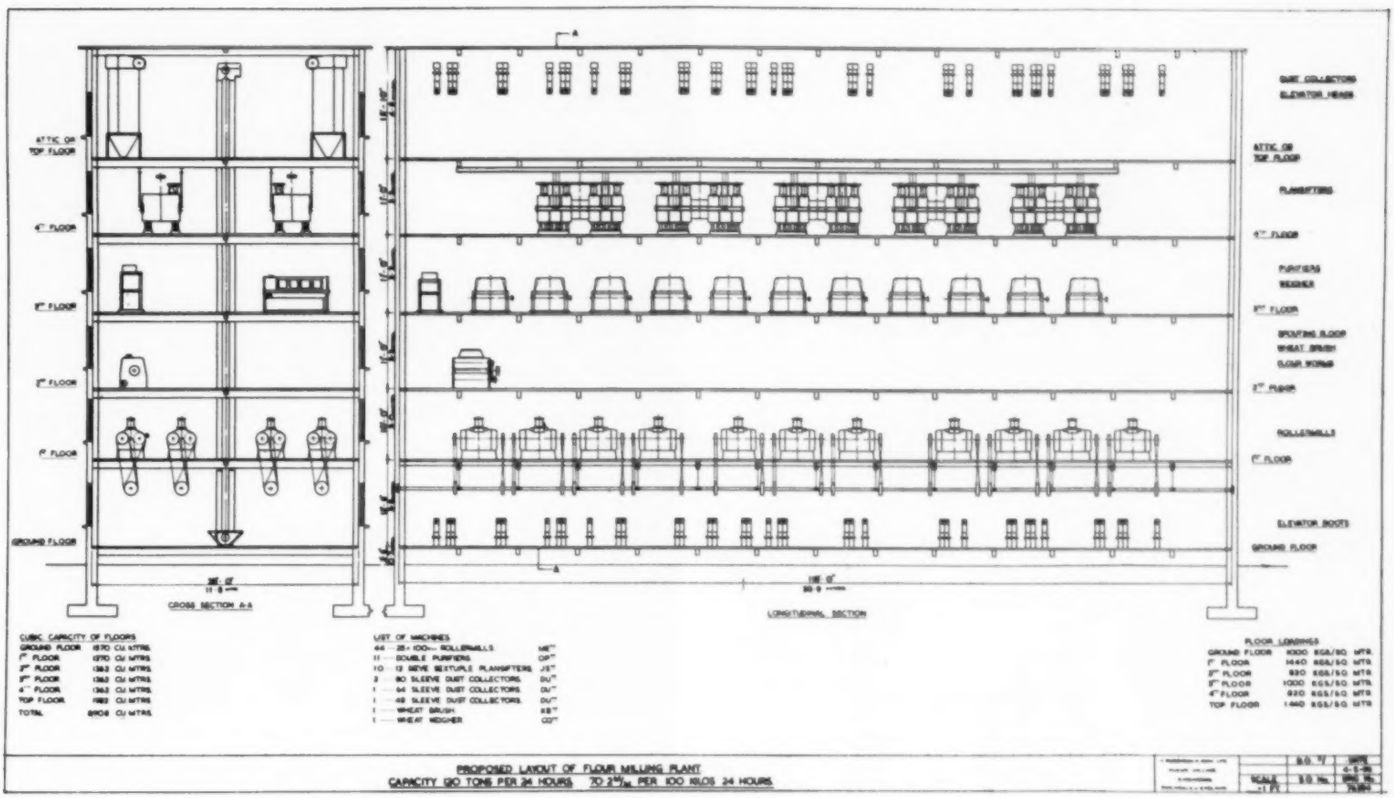
SWISS SILK

BODMER
DUFOUR
EXCELSIOR
NITEX
SCHINDLER
WYDLER

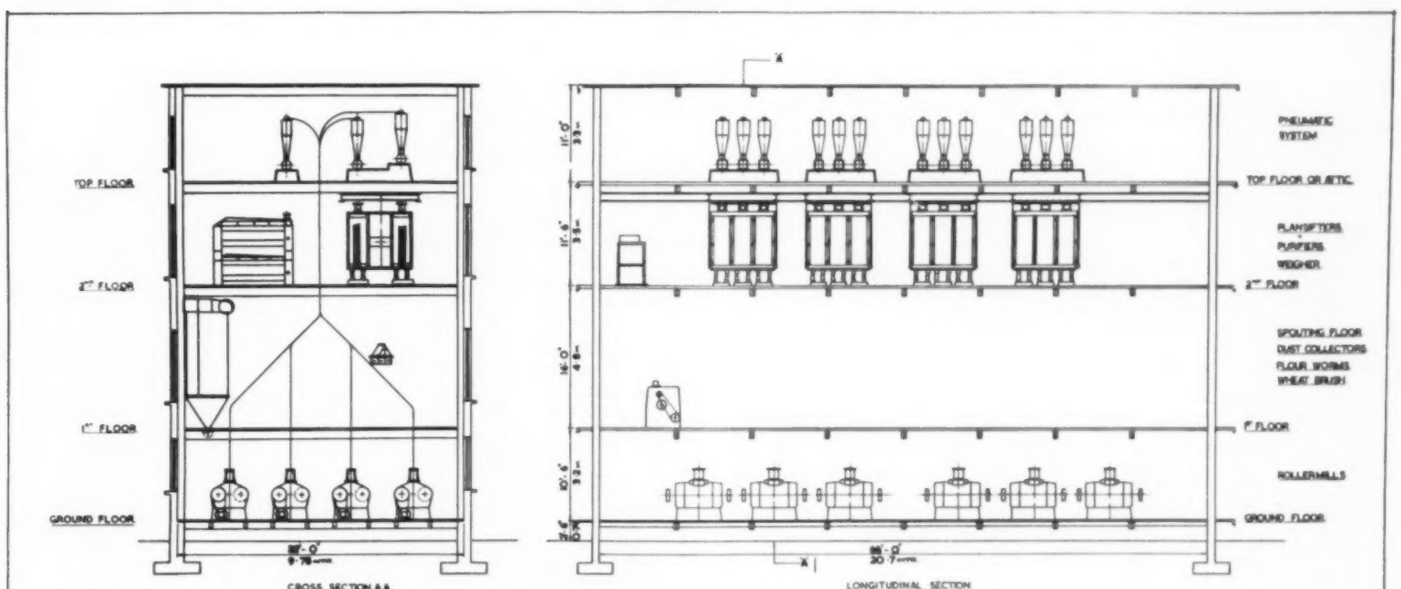
★

Comparison of Mills . . .

— Mill A —


ATTIC OR TOP FLOOR
4TH FLOOR
3RD FLOOR
2ND FLOOR
1ST FLOOR
GROUND FLOOR
DUST COLLECTORS ELEVATOR HEADS
PLANSIFTERS
PURIFIERS WEIGHER
SPOUTING FLOOR WHEAT BRUSH FLOUR WORMS
ROLLERMILLS
ELEVATOR BOOTS
CROSS SECTION A-A
LONGITUDINAL SECTION
CUBIC CAPACITY OF FLOORS
GROUND FLOOR 1870 CU MTRS.
1ST FLOOR 1870 CU MTRS.
2ND FLOOR 1363 CU MTRS.
3RD FLOOR 1363 CU MTRS.
4TH FLOOR 1363 CU MTRS.
TOP FLOOR 1183 CU MTRS.
TOTAL 8908 CU MTRS.
LIST OF MACHINES
44 — 25 × 100 — ROLLERMILLS ME"
11 — DOUBLE PURIFIERS OP"
10 — 12 SIEVE SEXTUPLE PLANSIFTERS JS"
2 — 90 SLEEVE DUST COLLECTORS DU"
1 — 64 SLEEVE DUST COLLECTORS DU"
1 — 48 SLEEVE DUST COLLECTORS DU"
1 — WHEAT BRUSH RB"
1 — WHEAT WEIGHER CQ"
FLOOR LOADINGS
GROUND FLOOR 1000 KGS/SQ. MTR.
1ST FLOOR 1440 KGS/SQ. MTR.
2ND FLOOR 830 KGS/SQ. MTR.
3RD FLOOR 1000 KGS/SQ. MTR.
4TH FLOOR 820 KGS/SQ. MTR.
TOP FLOOR 1440 KGS/SQ. MTR.
PROPOSED LAYOUT OF FLOUR MILLING PLANT
CAPACITY 120 TONS PER 24 HOURS 70 2⁴/₉₀ PER 100 KILOS 24 HOURS
SCALE
DRG. No.

— Mill B —


TOP FLOOR
2ND FLOOR
1ST FLOOR
GROUND FLOOR
PNEUMATIC SYSTEM
TOP FLOOR OR ATTIC
PLANSIFTERS PURIFERS WEIGHER
2ND FLOOR
SPOUTING FLOOR DUST COLLECTORS FLOUR WORMS WHEAT BRUSH
1ST FLOOR
ROLLERMILLS
GROUND FLOOR
CROSS SECTION A A
LONGITUDINAL SECTION
CUBIC CAPACITY OF FLOORS
GROUND FLOOR 680 CU MTRS.
1ST FLOOR 965 CU MTRS.
2ND FLOOR 705 CU MTRS.
TOP FLOOR 665 CU MTRS.
TOTAL 2985 CU MTRS.
LIST OF MACHINES
24 — 25 × 100 — ROLLERMILLS ME"
6 DOUBLE PURIFIERS PH"
4 24 SIEVE SEXTUPLE PLANSIFTERS PS"
1 72 SLEEVE DUST COLLECTOR DU"
2 48 SLEEVE DUST COLLECTOR DU"
1 LORD WHEAT BRUSH RB"
1 WHEAT WEIGHER CQ"
FLOOR LOADINGS
GROUND FLOOR 1440 KGS/SQ MTR
1ST FLOOR 820 KGS/SQ MTR
2ND FLOOR 830 KGS/SQ MTR
TOP FLOOR 1000 KGS/SQ MTR
PLANSIFTER SUPPORT 1440 KGS/SQ MTR
PROPOSED LAYOUT OF FLOUR MILLING PLANT
CAPACITY 120 TONS PER 24 HOURS 38 4⁴/₉₀ PER 100 KILOS 24 HOURS
SCALE
DRG. No.

Note—Mill capacity is about 2,000 cwt. basis 24 hours of operation

show up any deficiencies in the design of plain bearings, and in some cases it has been necessary to fit roller bearings, but for trouble free operation a well designed plain bearing is much to be preferred. Some millers express a desire for roller bearings, others for plain. I believe that most of the milling engineers provide both types as alternative, but for trouble-free operation over long periods, I personally would always insist upon a well designed plain bearing with adequate bearing surface.

With regard to the speed to which smooth (Dunst) rolls can be increased, there is a critical speed for every stock above which the ability of the rolls to grind efficiently is affected. In the case of smooth roll passages, the critical speed for a 10 in. diameter roll varies from 280 up to 395 r.p.m.

In all cases where rollermills are running at high speeds it is essential to limit the length of rolls to 40 in. and to ensure that the rolls themselves are properly balanced.

Sifters

In many ways, the most radical and spectacular improvements have been effected in sifter design, and when we recognized the need for such improvements, we also recognized that the stacked sieve type of plansifter, as used almost universally in North America, had a great many merits, particularly with regard to sieve design. Basically, the sifter that my own company developed and introduced on to the market some four years ago embodies the main principles of the North American sieve construction (with a number of improvements) with the "free swinging" motion which has been common in Europe for many years. Incidentally, this type of driving mechanism is now being employed by North American sifter manufacturers and the stacked sieve construction, which we at Rochdale introduced into Europe some years ago, is now being incorporated into the design of most modern sifters being made in Europe today.

In developing improvements into the design of the sieves, we employed a technique, which I believe, has never been adopted before in the case of flour milling machinery, that of using X-ray photography to find out what was really going on inside machines, and this proved of immense value, as, for the first time, we could see what was really going on inside the sifter when it was working.

There are many who will say that no matter what the design of a sifter, it is the amount of dressing surface that counts, but this is not correct, as I will endeavor to explain. With the old type of sifter, feeds are spread relatively thinly over the sieves whereas, in the case of the square sieve type of sifter, feeds are deliberately thickly spread on to the sieve so that particles stratify at the same time as others are being dressed through and the weight of the stock helps to dress through the fine particles that have found their way to the bottom and are resting on the top of the clothing. In order to obtain the depth of stock individual sieves are made of varying thicknesses and with distance pieces, the depth between sieves can vary from 2½ in. to 4 in. In all cases, the loose clothing frames which are inserted into the sieves are of standard size.

Naturally, the very deep sieves are used for bulky stocks, such as on break scalping, whereas the thinner sieves are used on flour dressing where there is neither the amount nor "bulk" of stock to require a greater depth of sieve. The distance pieces are of immense value as the effective depth of a sieve can be modified in a matter of seconds by inserting of these, should altered conditions require it.

The square sieve sifter has numerous distinct advantages over earlier types of construction, among which are:

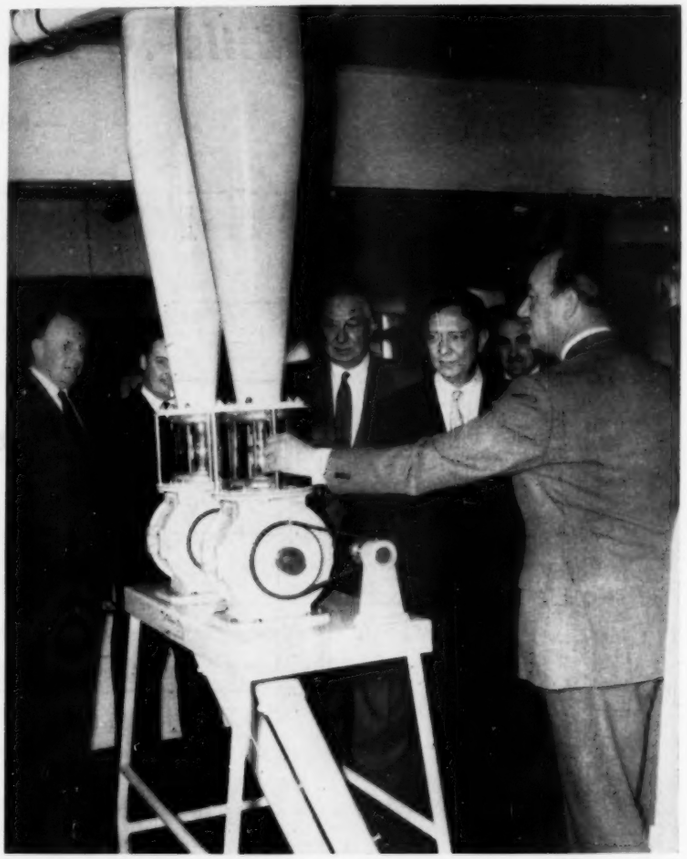
(a) Machines can be made of either four or six sections and all sieves are interchangeable.

(b) Sections can be made of up to 27 sieves deep.

(c) Each section can make up to seven separations.

(d) Each section can take two separate feeds if required, thus a six-section machine can handle 12 different stocks.

(e) Where a section is divided to take two separate feeds, there are no restrictions in allocating the number of sieves in that



VISITOR—Dr. Salvador Araneta, president and chairman of Republic Flour Mills Inc., the first flour mill in the Philippines, visited the Rochdale, England, factory of Thomas Robinson and Son Ltd., recently. He is seen here with executives of the Robinson organization in the company's demonstration room. From left to right: H. G. Cutler, Thomas Furness, Leslie Smith, Dr. Araneta. Denys W. Povey and C. S. Robinson. Robinson, who supplied the first mill, has recently received a repeat order for a new plant to virtually double capacity.

A typical experience in the work-a-day lives of thousands of industries.
DOGGONE IT, PETE, THIS HAS GOT TO STOP!
PLANT MANAGER
. . . just came from the bag-filling department . . . Not a man wearing a respirator.
I'm not surprised, Jim. The men would rather breathe dust than wear heavy old respirators.
I know it. But I'm supposed to enforce safety rules. Oh, for a light, comfortable dust mask!
Here's what you want, men—The Flex-A-Foam Dust Mask—light as a feather!
It's sure light and comfortable, but can it do a man-size job?
Seen Purchasing yet? They're up on new developments.
It should. It filters non-toxic dust particles 100 times smaller than you can actually see.
Order a trial dozen, Bob. Maybe they'll wear these without continual prodding.
They're glad to wear Flex-A-Foam Dust Masks. Our troubles are over!
LATER
You're right! We should now equip the entire plant!
(quantity prices as low as $1.10)
Send Today
$1.45
(industrial price only)
Try low-cost FLEX-A-FOAM and judge proof by performance.
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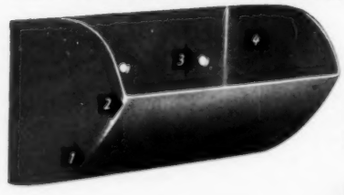

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(2) Scientifically formed lip aids in greater cup capacity.
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DECREASE YOUR COST

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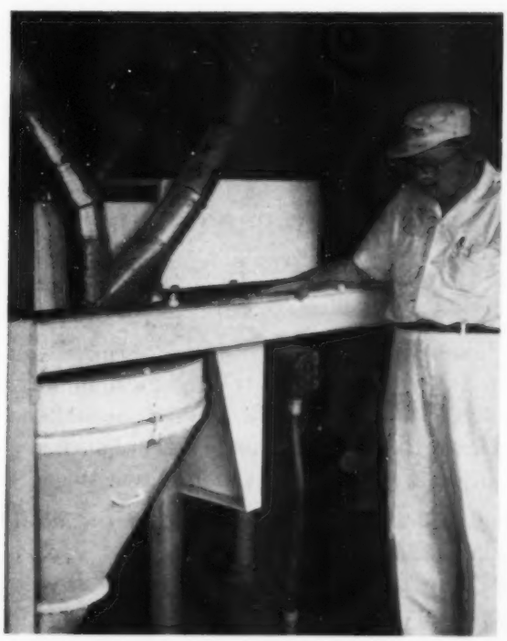

Pictured above is one of the new 27" Entoleter Centrifugal Impact Mills recently installed at Dixie-Portland. Mr. Cobble, Milling Superintendent, checks one of the new units which requires only 14.8 sq. ft. of floor space.

By using Entoleter® Impact Mills to perform certain milling functions, additional roller mill surface can be made available in any flour mill. This can mean an increase in total mill capacity by as much as twenty percent.

This new and effective application of centrifugal mills for milling of selected streams utilizes a relatively low cost machine which requires a minimum of floor space, power and man hours.

DIXIE-PORTLAND FLOUR CO. IN CHATTANOOGA, PROVES IT!

F. H. Cobble, Milling Superintendent for Dixie-Portland, has this to say of his new installation of Entoleter Impact Mills: "The Entoleter Mills we installed are doing an excellent job, consistently producing the grind we want. There is no problem of temperature rise. Freeing the roller mills of this step has given us a big jump in total capacity."

Write Now! We will be glad to send literature or arrange a visit to discuss this important new concept in grain milling.

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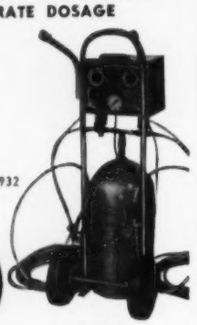

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section to the 12 different stocks.

(f) Sieves are stocked and clamped down inside the main frame of the machine, permitting all sieves to be withdrawn in a matter of a very few minutes with no possibility of leaks when the sieves are reinserted and the machine running with feed on.

(g) Square sieve construction permits stock to be tailed over and the throughs delivered from all and any of the four sides.

(h) Dome pad cleaners provide 100% effective and trouble free cleaning of sieve clothing.

(j) Full width and large size delivery channels avoid bottlenecks which are sometimes a real source of trouble with earlier machines.

Robinson has installed these sifters in mills all over the world, where they are working under all possible conditions—on hard wheats, on soft wheats, on wheat mixtures of high moisture content and low moisture content, in climates of high humidity and low humidity, in fact all extremes, and in all cases an average effective surface allocation of 10.74 sq. ft. per long ton capacity is considered ample compared with an average of 21.5 sq. ft. per ton capacity, which was not unusual with earlier types of sifters. Thus, you will see that there is not only a considerable saving in capital investment and space, but clothing power and routine maintenance as well.

Purifiers

In the case of the purifier the development of the multiple sieve purifier was the first step in obtaining greater capacity in a smaller unit of space with the added advantage of reducing the need to repurify certain stocks. Later purifiers were designed so that one machine could be mounted on top of the other, thereby reducing the floor space required by half, and at the same time greatly simplifying the arrangements for the subsequent conveying of purified stocks to rollermills, as all the machines can be concentrated close together and not spaced down the whole length of the mill building.

In modern mills, it is common practice to install purifiers on the same floor as the sifters. This greatly assists supervision, as there is no spouting down the side of the purifiers obstructing access, and a complete floor in the building is saved.

The stocks are pneumatically elevated to the purifiers and while some of the more old fashioned school of millers might say that this is not a desirable feature, this is a fallacy as experience has shown. Pneumatic elevation in no way damages the stock and is certainly much to be preferred to the worm conveyors that would otherwise be necessary if the purifiers were positioned immediately below the sifters.

The introduction of multiple sieve purifiers did present one problem; it was necessary to clothe the top sieve fairly coarsely and, as a result, there was very little feed on the tail sheet, insufficient in fact to cover the sieve. As a result of this, air passed through the open part of the tail sieve and not the stock so that branny particles passed through the sieve and were not overtailed. To overcome this disadvantage, we designed what is called a tail sheet aspirating grid and this concentrates there a relatively small amount of stock into channels through which the air must pass, lifting the light branny matter onto the collector grid. Thus, the difficult choice of either allowing some very branny stock to pass through the tail sheet, thereby contaminating the cleaner throughs, or using so much air that food stock is overtailed, can be avoided. The net effect of this tail aspirating grid is to ensure cleaner stock passing through the tail sheet and to reduce the amount of good stock overtailed. No one who has seen this machine in operation has failed to be impressed with the separation effected and the amount of branny matter that is lifted out and sent direct to wheat feed.

The efficiency is such that in no new flour mills that we have erected since the introduction of this machine has it been necessary to incorporate repurifiers in the flow.

Pneumatic Conveying

No doubt you will all be only too well acquainted with the advantages of pneumatic conveying for me to deal at any length with this subject and its effect upon the saving of space and cost of erection, but I would like to make brief mention of the proved advantages of the Pneuflow conveying with its direct pickup from rollermill hoppers.

This system is in operation, and has been for many years, in mills both small and large all over the world. It has enabled rollermills to be sited on the ground floor of a building with considerable saving in space and consequent building cost. In the case of existing mills, it has enabled capacities to be increased to a degree thought impossible some years ago without alterations to buildings.

It has also permitted the design of one floor mills contained within a simple weather structure.

Wheat Cleaning Department

There have been no sensational developments with regard to obtaining greater capacities or better work from less machinery in the wheat cleaning department as in the mill.

In the field of conditioning, attempts have been made to reduce the size and efficiency of equipment with varying success, but I do not think that anyone has produced an apparatus or machine that really does produce better flour, or flour at a lower cost, than does the well operated more conventional conditioning equipment.

Pneumatic conveying is incorporated in nearly every new or remodeled screenroom today, but if we are honest we must admit that basically it is but an improved method of conveying, in that it is neater and cleaner. Certainly with the old type of suction conveying there were disadvantages in that it is not economical to incorporate lifts over approximately 5 tons capacity; that in order to aspirate and clean the wheat properly it is necessary to employ a multiple of lifts and aspirating points; that a complicated system of controls and automatic valves is desirable to keep power consumption down to a minimum and to prevent choking when the feed runs off one of the lifts; that considerable height is required over the wheat cleaning machinery proper to install the receiver aspirators, and that wear on bends is a maintenance item not to be ignored.

For these reasons we have abandoned the suction system of pneu-

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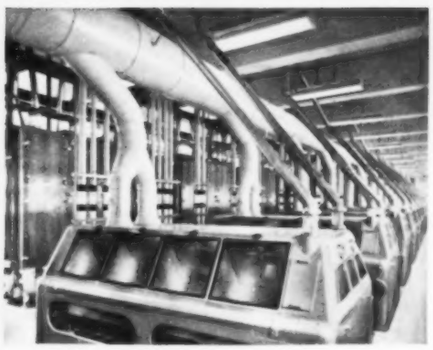
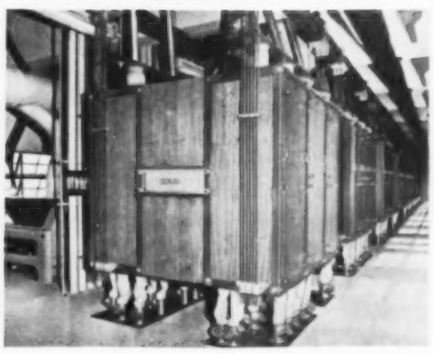
First flour mill in the Philippines





Robinsons have completed the most comprehensive project ever carried out by a firm of flour milling engineers and consultants—the installation of the first mill in the Philippines. For advice and service on all aspects—site, design, staffing, operation and the numerous complexities of modern milling—the executives of Republic Flour Mills turned to Robinsons. So successful was this project that Robinsons immediately received a repeat order for increasing the mill's original output of 17,250 lb. per hour to 32,000 lb. per hour. This most modern mill in the world is fitted throughout with Robinson's latest high capacity machines. Whatever the type or capacity of milling installation Robinsons have the machines and the service for the job.

TOP: The first flour mill in the Philippines. LEFT: Robinson purifiers type PHm with the unique tail sheet aspiration grid. BOTTOM LEFT: The Robinson roller floor with its smooth quiet efficiency is in a class by itself. BOTTOM RIGHT: The Robinson Square-Sieve Sifters give a dressing unequalled by any other machine of their type yet produced.

Planned, designed, engineered, equipped and started up by

Robinson

Thomas Robinson & Son Limited, Rochdale, England
Kipp Kelly, Ltd., 68 Higgins Ave., Winnipeg, Man., Tel. 922507

matic conveying and now install a pressure conveying system.

With such systems, the exhaust is applied to individual cleaning machines and the dust, aspirations, etc., separated at the immediate point, where they are loosened, such as on a scourer. This is the sensible and logical thing to do. By these means, such as existed in the well equipped and run elevator screenroom, it is not necessary to have excessive aspiration points as the aspiration thus applied is efficient. The pneumatic conveying system becomes essentially a simple and straightforward means of replacing worm conveyors and bucket elevators with considerable benefits.

In pressure conveying, blowers are employed. The system has numerous advantages over suction conveying systems. For example, up to 10 tons per hour can be conveniently and economically conveyed in a small pipeline; the conveying velocities and air quantities are considerably lower, therefore smaller conveying pipes can be used with much less wear at bends; no complicated valves or controls are necessary; the power required varies directly with the load and not inversely as is the case with suction conveying; power consumption is less; grain can be pumped directly into bins; very little height is needed above machinery or bins to which the grain is being conveyed, and it is altogether neater and more compact.

—BREAD IS THE STAFF OF LIFE—

SCRANTON MANAGER DIES

SCRANTON, PA.—Gerald J. Culkin, general manager of the Scranton branch of King Midas Flour Mills, died here recently. He was 55. Mr. Culkin was a charter member and past president of the Northeastern Pennsylvania Association of Manufacturers Representatives.

Project Will Seek Quicker Protein Test

FARGO—The department of cereal technology, North Dakota Agricultural Experiment Station, is initiating study of a quick type of protein test for spring wheat versus the standard Kjeldahl method.

The project, which is directed by Dr. R. H. Harris, cereal technologist, will help elevator men and others buying and storing grain to decide whether to invest in equipment with which to make the "quick" type of analysis on their own premises or to rely on the standard type test run in a laboratory (and in use for a long period of time) which, though time consuming and cumbersome, is extremely accurate.

The project will be financed in part by a grant of $500 from the North Dakota Wheat Commission, and by Hegman, Inc., Minneapolis, a manufacturing firm, which will provide equipment and chemicals valued at $1,200 for the project.

Accuracy, time and ease of performing the tests will be studied.

A quick, easy method of protein testing at the local elevator, if it were accurate, would help elevator operators to bin lots of grain of comparable protein values for shipment to terminals and to millers.

Marjorie Neubauer, Bottineau, home economics senior at NDAC, will run the new method tests under Dr. Harris' direction.

—BREAD IS THE STAFF OF LIFE—

USDA Report Explains Stored Corn Aeration

WASHINGTON — Aerating stored grain early in the fall to bring grain temperatures down near the average of the outside air helps prevent insect activity and spoilage in wheat and corn. This and other information from grain aeration tests in the Corn Belt are given in a report issued by the U.S. Department of Agriculture.

Researchers in USDA's Agricultural Marketing Service conducted these tests in Iowa and Indiana. The tests in Iowa included nine deep bins of shelled corn; those in Indiana included five flat and two tank-type storages of shelled corn, seven deep bins of wheat, and two oil-tank storages of soybeans. Various methods of operating the aeration systems were used.

Costs of operating aeration systems depend largely on the rate of airflow, depth and kind of grain aerated, and number of hours the fan is operated. Typical operation costs vary from 1/20¢ bu. for aerating shelled corn in a flat storage to ⅛¢ bu. for aerating wheat in deep bins.

A free copy of the report, "Operating Grain Aeration Systems in the Corn Belt," Marketing Research Report No. 337, may be obtained from the Office of Information, U.S. Department of Agriculture, Washington 25, D.C.

—BREAD IS THE STAFF OF LIFE—

CANADIAN FLAX EXPORTS

WINNIPEG—For the third successive year exports of Canadian flax have gone only to overseas countries and the combined movement for August and September of the current crop year of 1,526,000 bu. compares with 1,010,000 bu. cleared in the same months of 1958. The U.K. was not a buyer in the two months under review, but the statistics branch of the Board of Grain Commissioners showed 198,000 bu. cleared to Japan; 151,000 to Germany; 36,000 to Greece, and 28,000 bu. to Denmark.

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August Keller

Swiss School Ends Second Course for Milling Students

ST. GALLEN, SWITZERLAND—Dr. E. Ziegler, head of the Swiss Milling School here, addressed graduating students from Italy, Germany, Denmark, Austria and Switzerland recently at a farewell dinner party honoring their graduation. Dr. Ziegler emphasized that "human relations are as important as the theoretical knowledge learned."

Dr. Ziegler thanked the teachers for their contributions to the students, and made the point that "since these young men will someday be in the position of mill superintendents, or production managers, it is important to train them in this direction." Already their daily contacts have helped to create general understanding, master personal conflicts, and to contribute to good fellowship, he said.

Special greetings were extended to August Keller, long time milling expert, who is now a fulltime teacher. Mr. Keller held the position of technical director in a large flour mill in Holland for 20 years.

On behalf of the school, thanks were extended, also, to Buhler Bros., Uzwil, for its financial support and the example set by a private enterprise firm in helping to make the school possible.

The third course at the school has been in progress, also, comprising 21 students from Germany, Austria, Italy, Israel, Mexico, Japan, Argentina and Switzerland.

——BREAD IS THE STAFF OF LIFE——

West Virginia Opens New Sales Territory

NEW ORLEANS—As a means of further improving sales service and technical assistance to its multiwall bag customers, West Virginia Pulp & Paper Co. has created a new sales office to be known as the Middle Atlantic sales district, it was announced by Jason M. Elsas, regional manager, multiwall bag division.

The new office will cover the states of Maryland, Virginia, North Carolina and South Carolina.

H. Lockwood Frizzell, formerly a sales representative for the division, has been promoted to district sales manager for the new district, which will be headquartered in Charlottesville, Va.

Victor Chemical Works, Stauffer Merger Approved

CHICAGO — Victor Chemical Works' shareholders, at a special meeting held recently, approved a plan of merger with Stauffer Chemical Co., August Kochs, Victor chairman, announced. Mr. Kochs also stated that the merger had been approved by Stauffer's shareholders at a special meeting in San Francisco.

In his report to the shareholders, Mr. Kochs stated, "The results of this year's operations to date were the best in the company's history."

Sales for the third quarter totaled $14,836,839 compared with sales of $13,417,575 for the corresponding quarter of last year. Sales for the first nine months of 1959 were $45,190,282 compared with a total of $39,593,296 for the similar period of 1958.

Victor's net earnings for the third quarter of 1959 totaled $1,260,288 which, after preferred dividends, is equivalent to 71¢ per share on 1,697,101 common shares outstanding. Net earnings for the corresponding quarter of 1958 were $906,405, equivalent after preferred dividends, to 50¢ per share on 1,684,311 common shares then outstanding.

For the nine months ended Sept. 30, 1959, Victor's net earnings were $3,761,682, equivalent after preferred dividends to $2.12 per common share. For the nine months ended Sept. 30, 1958, net earnings were $2,608,513, equivalent after preferred dividends to $1.44 per common share.

Since founding the company 62 years ago, August Kochs has been the chief executive of Victor Chemical Works. In commenting on the merger he stated: "We look forward to continued growth and progress of our business and greater opportunities for achievement with our new associates."

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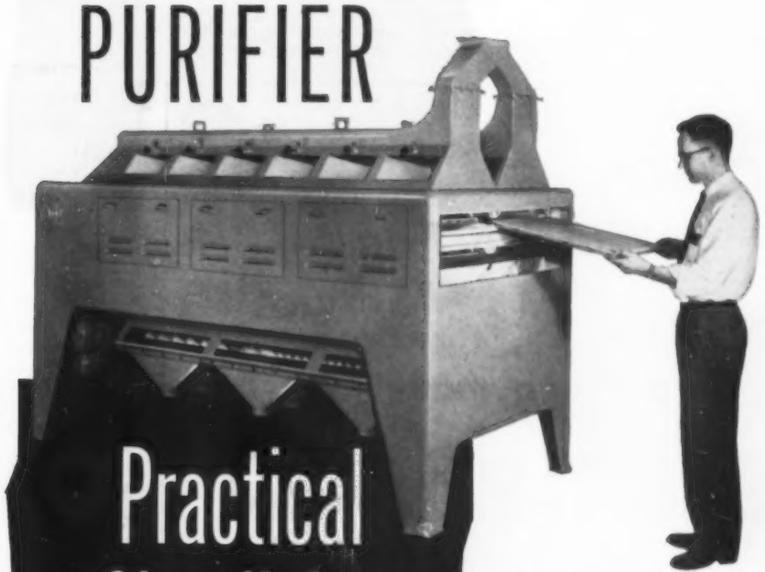

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Shawnee Milling Improves Consumer Bag Packing with New Bemis Machines

SHAWNEE, OKLA. — Shawnee (Okla.) Milling Co. has brought "push-button" operations to its consumer bag packaging department with the installation of a new Bemis feeding and filling machine and Trim-Weigh scale. The new Bemis equipment also has made possible product packaging speeds and economy unattainable with equipment previously in operation.

Shawnee conducted an intensive study of available packaging equipment before the installation of Bemis equipment.

The packaging arrangement, with conveyor lines hooking directly to the Bemis Deltaseal closing machine, has improved output, especially in efficiency of operation.

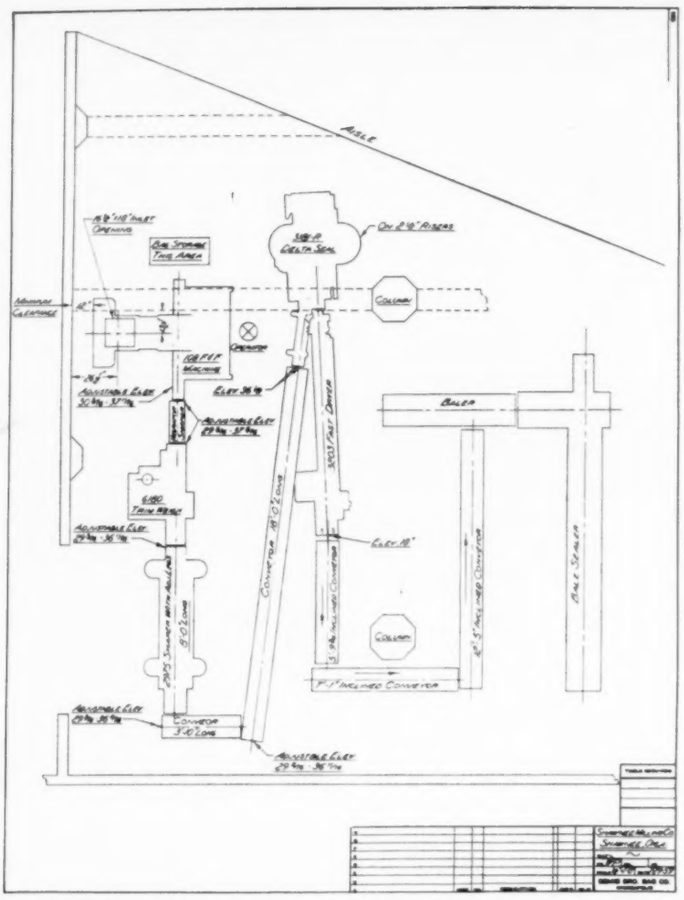
Bags are opened automatically and fed to the filling spout from a magazine supply. Two bags are filled simultaneously. The two bags, in tandem, move to a duplex Trim-Weigh scale which checks and finishes the weighing of each bag independently.

The unit is capable of feeding and filling flour and meal at better than 40 five-pound bags a minute with a weight tolerance of plus or minus .2 of one ounce. The unit will handle 2, 5 and 10-lb. bags with a tube width of 6 in. to 10½ in.

Shawnee Milling was faced with an ever-increasing volume of small flour and cornmeal bags that its equipment could not handle prior to installing of the new Bemis F & F Machine. Its problem now solved, Shawnee also is getting more accurate weights.

The company was founded in 1906 by the late J. Lloyd Ford. From its inception, Shawnee Milling has increased its volume of production each year. It also owns and operates a mill in northwest Oklahoma, the Okeene Milling Co. The two flour mills currently have a combined capacity of 6,500 cwt. flour, 1,200 cwt. corn meal, 250 tons mixed feeds, and elevator storage facilities for 3,150,000 bu.

Design of the packaging line and equipment was handled by the Bemis packaging service department.



PACKAGING LINE—The accompanying schematic drawing shows the packaging line developed by Bemis Bro. Bag Co. for filling, weighing, shaping and closing of small paper bags as part of an operation such as that now being used by Shawnee Milling Co. in Oklahoma. The entire packaging line was set up in a minimum of floor space.

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Cargill Adding Dump At Texas Elevator For Railroad Cars

PORT ARTHUR, TEXAS — Construction of hydraulic equipment to increase by one third rail car unloading of grain at the Cargill, Inc., export elevator here has been announced by Cargill and the Kansas City Southern Railway Co.

The new dump, scheduled for completion Jan. 1, will empty a loaded car up to 50 ft. in length by tilting it from end to end, causing the grain to pour out into an underground conveyor. Eight cars an hour can be unloaded, according to John V. Lundgren, superintendent.

New dump service equipment is also being installed including an elevator "leg" which picks up grain from the conveyor, a garner, a receiving scale capable of receiving and weighing up to 2,500 bu., and distribution conveyors from the scale to storage bins.

"This new installation is the latest in a series of improvements designed to make more efficient our processing of Midwestern grain into export channels," Mr. Lundgren said. Earlier this year elevator capacity was increased to 3.3 million bushels, more than double the former storage space.

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Quality Control: Milling for a Profit

A Prize Winning Essay by Eamon P. Ferguson

ONE of the biggest headaches to flour millers in the past can be attributed to complaints received regarding finished products. The number of these complaints extended would run quite a sizeable list. When one considers the almost criminal ingenuity in carelessness of which the human element is capable, we readily realize that the "possible" number of "possible" complaints that we could run into is "impossible" to determine.

Most of the complaints can be included under the following three headings: (1) Those brought about through carelessness or inefficient plant; (2) those which at times are difficult to avoid, and (3) those which are produced through inefficient knowledge of the subject matter and customer's requirements.

In our efforts to prevent these complaints, or rather the faults that lead to them from occurring, we flour millers have at our disposal, I am sure, the most effective weapon we could hope for, namely, "statistical quality control." This system of control was developed by the United States government during World War II because of the increasing need for some new control system to help cut down and, if possible, eliminate the very large amount of waste materials and the excessive number of rejects that they were incurring in almost all of the plants at work filling government orders.

EDITOR'S NOTE: Mr. Ferguson is with the Maple Leaf Milling Co., Ltd., Toronto. The accompanying paper is the prize winning essay he submitted in the recent competition organized by District 8, Association of Operative Millers.

The various companies that had government contracts to fill during that period and who used this new quality control system found it so rewarding from many points of view, mainly from a "financial standpoint," that most of them kept it in operation even after these contracts were filled and peace was restored.

Since then, and even though it is still in its infancy, statistical quality control has spread to all industries; it is in use all over the world and has attained such a large degree of success that it is doubtful whether there is any limit to its scope.

Objects Described

In describing the objects of statistical quality control, I quote Mr. Allan, metallurgical statistical analyst for the American Iron and Steel Institute: "Variation is always present in the measured quality of manufactured products. This variation can be subdivided into 'chance causes' and 'assignable causes.' The chance causes are inevitable, but the assignable causes can usually be detected and corrected by appropriate methods."

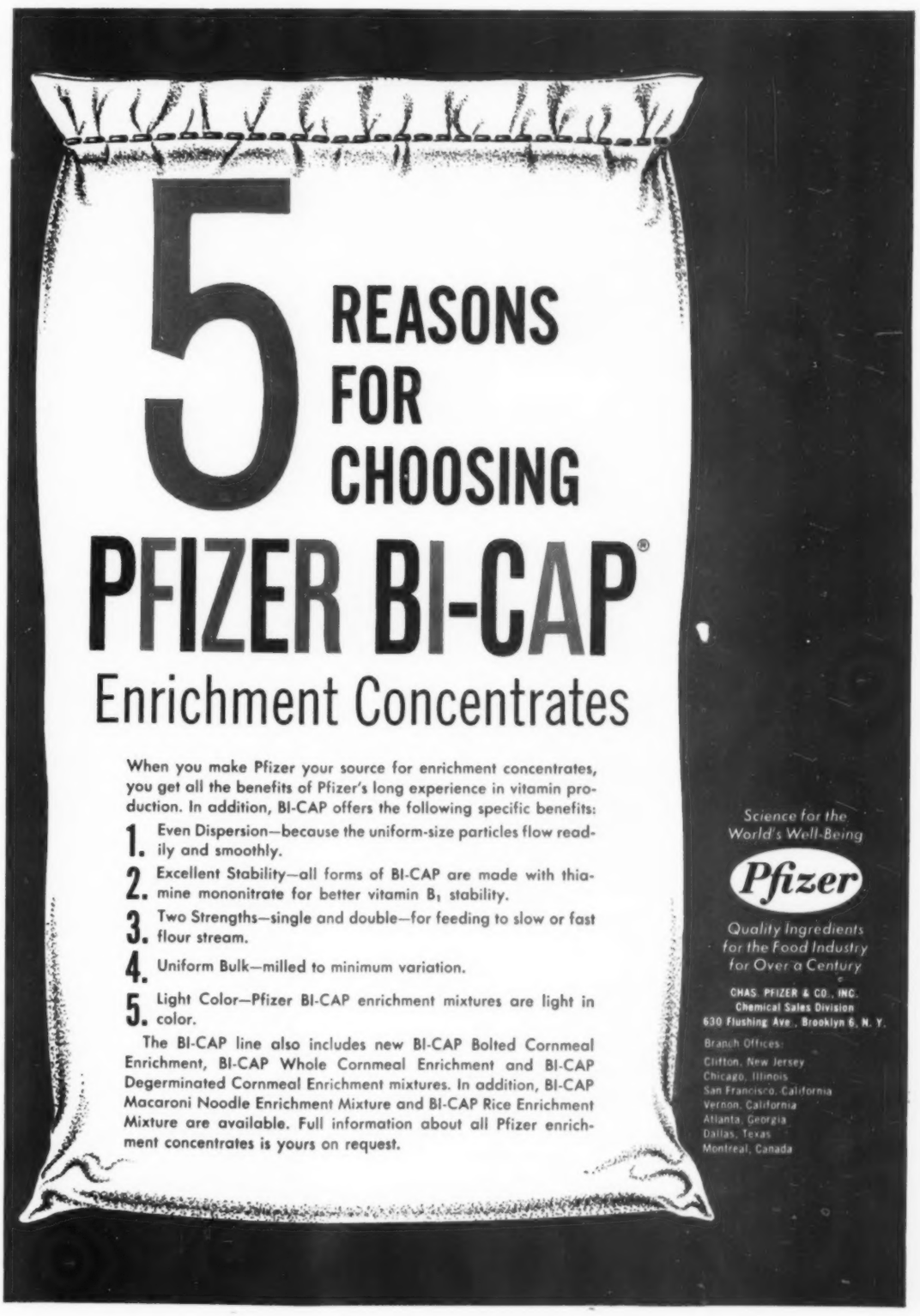
With the introduction of statistical quality control which employs statistical principles and methods that have been developed to assess the size of chance causes variation and to detect assignable causes variation, we can install statistical control at various points in the production system and, with the use of these check points, greatly reduce the variation in quality. This enables us to utilize to the best advantage the raw materials at our disposal.

This system is much superior to the older system of inspection and control. With the old system it was necessary to check the finished production coming off the production line before any assessment of its quality was possible, with the result that if part of the production was poor in quality it would not be possible to catch and correct it before a considerable amount of time had elapsed and much of the production had been spoiled. To us in the flour milling industry this has meant the needless expense of lost time, production, wages and the downgrading of our flour, etc., as well as the ever present fear that the fault would not be noticed before some of this poor quality stock had been used to fill waiting orders.

Concepts of Control

To cover statistical quality control and its concepts completely would take many pages and much more time than I have at my disposal in this paper, even if I were familiar with all of them. What I propose is to crack the shell as it were, and in so doing give a very scant look at what it is all about.

The basic techniques of statistical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quality control are derived from mathematical characteristics in what is known as a "normal distribution pattern" that has been obtained from a set of quality characteristic data subject to chance causes alone. This distribution, when extended to graph paper, is shown as a symmetrical bell shaped curve, which represents a distribution of individual values with these mathematical characteristics:

(A) Central Tendency or Average: The normal curve has an average, which is the sum of a number of observed values in a set divided by that number of observations;

(B) Standard Deviation or (Sigma Limit): The normal curve has a standard deviation and is the deviation of the observed values from their average and may be said to divide the range of a set of data into six equal parts, three on each side of the central tendency;

(C) Variation Pattern: The normal curve can be divided into areas under the curve that contain specific percentages of the data used. The most commonly quoted areas are:

Between the average plus or minus, one standard deviation—68.26% of the data is represented; between the average plus or minus, two standard deviations—95.46% of the data is represented, and between the average plus or minus, three standard deviations—99.73% of the data is represented.

Because this is so, it follows that if we compute the average and standard deviation for any set of data whose variation pattern closely resembles the normal curve described above, approximately 68.3% of the values will lie between the average plus or minus one standard deviation: 95.5% of the values between the average plus or minus two standard deviations and 99.7% of the values between the average plus or minus three standard deviations. This information is the basis for the assessment of whether or not a process is capable of working within given limits, providing the variation pattern is normal.

All this might have been of little use to us, due to the fact very few processes can be said to have a normal variation pattern, had it not been for the very important discovery that it was possible to convert the data of a non-normal distribution to closely resemble that shown by the normal curve. The means of conversion is to select small groups of readings from within a non-normal distribution and average them. The distribution of these averages will then closely resemble the normal curve. So we are placed in the favorable position that no matter how distorted a distribution we encounter it is still possible to convert it to a distribution and pattern which closely resembles the normal one, and so enables us to derive approximately the same mathematical characteristics as used for a normal curve.

Control Charts

Now the question arises, how can we best utilize these discoveries? We know, for instance, that with a distribution subject to "chance causes" alone, only .27%, or in other words, three in every thousand of the observed values, will fall outside three standard deviations. Anything in excess of this usually means the addition of an assignable cause. The answer to this question is obvious: We can use the third standard deviation or third sigma limit as a control limit for the process and with the aid of a chart on which these limits have been drawn in, control the process by means of checks taken on a time basis. This chart then takes on the name of a control chart. The advantages are that different trends in variation as well as the presence of lack of control can quickly and easily be detected, and so cut down the time between detection and correction if lack of control is noted.

When picking the control chart to be employed in installing statistical quality control, we must choose the one best suited for the particular job we had in mind, as there are a number of statistical control charts available.

Each one of these charts has its own mathematical basis and is best suited for a particular job; but for all this, they are very similar in fundamental concepts. These concepts are that they all have limits outside of which, if a value lies, except for three times in every thousand, it does so because of an "assignable cause," which in turn warrants corrective action.

One of the main types of statistical control charts is the average and range one, and as I only have room to describe one type of chart here, I am going to use it as the example for all the other charts. The average and range chart is best suited where measurement or variable data is being considered. The reason for both the average and the range being that, with measurement data, we are interested in the central tendency and variation; in other words, the average and the range. This makes each check period in effect a process capability study of its own, representative of the time period when the sample group was taken.

Before commencing with the chart, there are a number of points to be considered and rules to be set down.

First of all, what objectives will we have in mind when using the chart? It might be used as a fast means of taking corrective action when lack of control is detected in a process. It could just as easily be used to enable us to uncover assignable causes, with the view of improving the quality of our product.

The second point regards the part in the process on which to try it. In deciding this, we might choose a point in the plant where the largest return in terms of dollars is quickly and easily noted. This will vary from plant to plant, one operation giving more trouble than another as regards rejects and/or returned production; however, it might be suggested at this point that all packing out operations be placed under a statistical weight control system. This can be very revealing, understandably so, when one considers that an operator, in attempting to pack the specified amount in each container, will in most cases overweigh rather than underweigh. This will occur no matter how weight conscious you keep the packing foreman and his personnel. The introduction of the control system at this point is, in most cases, very much worthwhile, especially if that often underestimated, but nonetheless-dangerous enemy of ours "invisible loss," is higher than should be allowed.

Sample Sizes

Third, what size group of samples should we take at each check, and how large a time interval should we allow between these checks? The size of the group will depend largely on

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the type of chart and point in the process under observation, e.g., a group of five being advisable for an average and range chart at work on a packing operation. The interval should be long enough to ensure that any significant change in result from one check to another is due to an assignable cause providing, of course, that the conditions existing during the time of sampling are relatively constant.

Last, but not least, a form should be drawn for use in collecting the data at each check period. It must be one that affords fast recording of the information and easy compilation of the average and range of the samples.

When these points have been decided, we can start accumulating the data, making sure that the methods of sampling are never varied. If they are at any time, it represents a variation due to an assignable cause. Any change since the previous check was carried out, such as material, operator, machine settings, etc., should also be recorded.

Before taking any corrective action or setting up any limits for the process, it is advisable to collect the data of at least 25 separate check periods. We can then be sure that these limits are of a sound mathematical basis.

After these first tentative limits have been put into operation we can go ahead with the work of detecting and correcting the assignable causes and the computation of new and better limits as time and improvements warrant it. This work will be required for some time, until we at last reach the stage where any further improvement of the process, or tightening of the control limits, would be economically unfeasible.

When it is in full swing, statistical quality control can be used to assess the capabilities of a process with regard to what it is doing and what it is supposed to be doing. There are many other uses and benefits to be derived from this system of control, but if one is still to be convinced of the advantages of statistical quality control, I think asking the following questions will change his mind:

1. How much money is at present tied up in wasted materials and labor as a result of rejected or downgraded production?
2. How much excess production is required to compensate for that poor quality production?
3. How much money is at present required to pay salaries of the existing inspection and control staff, needed to spot poor quality productions and in detecting the source of the trouble?
4. How large are the present cash losses that we are incurring as a result of discounts on down graded production and the settlement of customer claims?

The answers to the above questions will leave little doubt as to the need for improved product quality and how elaborate a program is required to attain this improvement. However, the miller, in planning statistical quality control into the process or, in maintaining it after it has been put into operation, controls the ability of the system to pay off in improved results.

This point taken into consideration, the association of statistical quality control with the milling process, will make it possible to greatly reduce the amount of reject and wasted production that is inevitable when this system of control is not in use. It also enables us to adhere much more closely to the product quality required. This in turn effects a reduction in the cost of production and enables us to put a higher quality product on the market.

The impact of these improvements will be shown in the resultant increased sales and profits at the end of the year, which, after all, is what we flour millers must accomplish if we are to continue "Milling for a Profit" in the highly competitive food market of today.

CANADIAN FLOUR CONSUMPTION DROPS

TORONTO — Preliminary figures indicate that the per capita consumption of wheat flour in Canada for the crop year 1958-59 amounted to 136.6 lb. It is not expected that subsequent revisions will materially affect this figure. During the crop year ended July 31, 1958, per capita consumption was 138.4 lb. flour.

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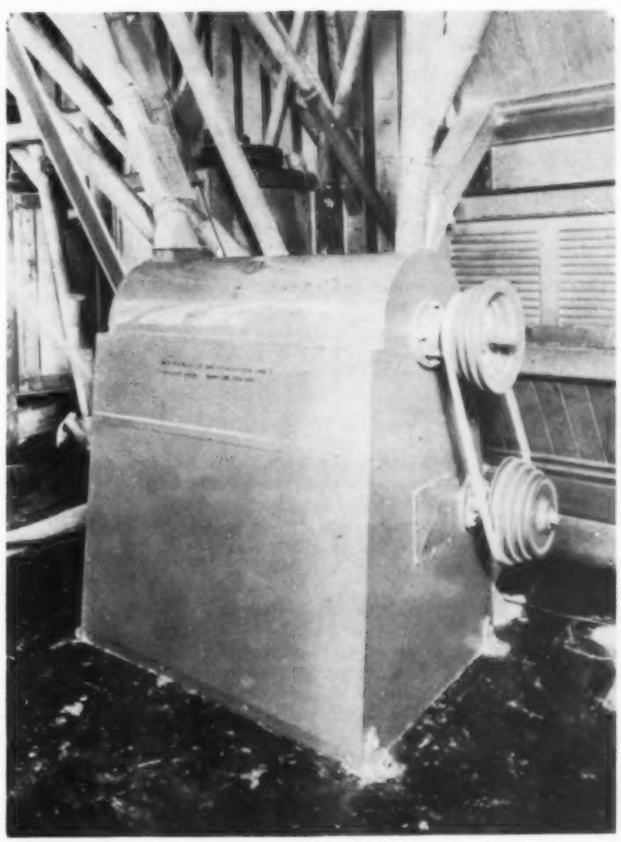

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Cereal Chemists Announce Meeting, Session Chairmen

ST. PAUL—The 45th annual meeting of the American Association of Cereal Chemists will be held at the Morrison Hotel, Chicago, May 1-5, it has been announced. D. B. Pratt, Jr., the Pillsbury Co., Minneapolis, AACC president, will be the presiding officer.

Robert B. Koch, Quartermaster Food & Container Institute, Chicago, will be program chairman and Edward Feigon, Kitchen Art Foods, Chicago, will be in charge of local arrangements..

The technical sessions will begin Monday afternoon with four 40-minute talks by invited speakers. Tuesday morning the regular technical program gets under way with concurrent sessions scheduled for all day Tuesday and Wednesday. Any AACC member wishing to present a paper at the meeting should contact the session chairman immediately.

The scheduled sessions and chairmen are: Cereal processing, Harry G. Obermeyer, Central Research Laboratories, General Mills, Inc., Minneapolis; flavor research, John Coleman, Central Research, General Foods, Inc., Tarrytown, N.Y.; prepared mixes, James Tucker, Victor Chemical Works, Chicago Heights, Ill.; baking and baking technology, Roy C. A. Bradshaw, Quaker Oats Research Laboratories, Barrington, Ill.; process control in the fermentation industry, George J. Fuld, department of food technology, Massachusetts Institute of Technology, Cambridge, Mass.; general session, Eugene F. Garner, Quartermaster Food & Container Institute, Chicago; feeds and feed supplements, John Mahoney, chemical division, Merck & Co., Inc., Rahway, N.J.; starch research, Thomas J. Schoch, research department, Corn Products Refining Co., Argo, Ill.; cellular concepts in cereal research, Stanley A. Watson, research department, Corn Products Refining Co., Argo, Ill.; marketing research and statistics, Howard Bauman, Research Laboratories, the Pillsbury Co., Minneapolis; cereal protein research, Dale K. Mecham, U.S. Department of Agriculture, western utilization and development division, Albany, Cal.; methods and gadgets useful in control, Donald C. Meek, the Pillsbury Co., Minneapolis.

Open technical committee meetings are scheduled for Thursday morning and the AACC's annual business meeting will take place Thursday afternoon. AACC officials expect a record attendance of close to 1,000 members, wives and guests.

——BREAD IS THE STAFF OF LIFE——

St. Regis Income, Sales Rise Sharply

NEW YORK—St. Regis Paper Co. has reported net income for the first nine months of 1959 at $19,772,667, equal to $2.20 a share on 8 840,863 shares of common stock outstanding. This compares with $13 195,053 for the first nine months of 1958, equal to $1.52 a share on the 8,446 555 shares. The company reported that the 50% increase was due mainly to the greater utilization of plant facilities resulting from higher rates of production, as well as to the larger sales volume.

Sales in the first nine months amounted to $317,848,125.

USDA Issues Report On Grain Aeration

WASHINGTON — Aerating stored grain early in the fall to bring grain temperatures down near the average temperature of the outside air helps to prevent insect activity and spoilage in wheat and corn. This and other information from grain aeration tests in the Corn Belt are given in a report issued recently by the U.S. Department of Agriculture.

Researchers in USDA's Agricultural Marketing Service conducted these tests in Iowa and Indiana. The tests in Iowa included nine deep bins of shelled corn; those in Indiana included five flat and two tank-type storages of shelled corn, seven deep bins of wheat, and two oil-tank storages of soybeans. Various methods of operating the aeration systems were used.

USDA said costs of operating aeration systems depend largely on the rate of airflow, depth and kind of grain aerated, and number of hours fan is operated. Typical operation costs very from one twentieth of a cent per bushel for aerating shelled corn in a flat storage to one fifth of a cent per bushel for aerating wheat in deep bins.

Grain Storage Said To Be Over-Expanded

CARROLLTON, TEXAS — Walter Blanton, president of the Texas Grain & Feed Assn. has reported a record grain crop in Texas, but noted that "Texas and the Southwest have overbuilt their storage facilities for surplus grain."

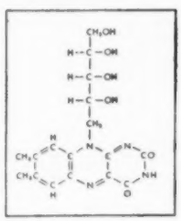
"At least 60 million bushels of empty storage space now is available in Texas, including about 5 million bushels of storage capacity right around Dallas," he said. "There is an additional 30 million bushels of empty grain storage standing in Oklahoma."

The Vital Story

A Quick History. Independent investigators, working separately to unlock several of nature's doors, sometimes open up unsuspected relationships. This happened with vitamin B_2.

Investigations. About 25 years ago, several groups, notably Warburg's, were investigating a "yellow enzyme" obtained from yeast. Almost simultaneously other investigators were studying a food factor that aided growth of laboratory animals.

What they found. Proceeding with chemical analysis of this growth factor, the team of Kuhn, György, and Wagner-Jauregg noted a relationship between the growth-producing agent and the "yellow enzyme." Their findings, and those of other researchers along similar lines, were published in 1933. Eventually, riboflavin and an essential part of the yellow enzyme were found to be identical and the unity of an essential nutrient and cellular metabolism was established.



Isolation of pure riboflavin was achieved by Kuhn and his co-workers, and by Ellinger and Koschara, in 1933.

Nomenclature. Known in the United States as riboflavin, this vitamin has also been called lactoflavin, ovoflavin, hepatoflavin, and vitamin G.

SYNTHESIS

By 1935, two eminent chemists, working separately, had synthesized riboflavin, practically in a dead heat. Prof. Paul Karrer of the University of Zurich, a collaborator of the Hoffmann-La Roche Laboratories, produced the first successful synthesis. Five weeks later Richard Kuhn of Germany announced his synthesis of the vitamin. Prof. Karrer subsequently shared the Nobel Prize in Chemistry for his work in vitamins and carotenoids.

The Karrer synthesis forms the basis for chemical processes in widespread use today by Hoffmann-La Roche and other leading manufacturers throughout the world. Riboflavin is also manufactured today by fermentation methods.

CHEMICAL AND PHYSICAL PROPERTIES

Riboflavin is yellow, slightly water-soluble with a greenish fluorescence and a bitter taste. Its empirical formula is $C_{17}H_{20}N_4O_6$. Vitamin B_2 produced by the Roche process is identical in every way with that occurring in nature.

How does vitamin B_2 work? Riboflavin is a vital part of nature's chain of reactions for utilization of carbohydrate energy. It has been found to be a constituent of many enzyme systems and is thus intimately connected with life processes. It is probably required by the metabolic processes of every animal and bird as well as by many fishes, insects and lower forms of life. (In certain animals, however, the requirement may be synthesized by bacteria within the intestine.)

In the cells riboflavin goes to work attached to a phosphate group. This substance, known as riboflavin-5′-phosphate or flavin mononucleotide, may in turn be attached to still another essential substance, adenylic acid, forming flavin adenine dinucleotide. Either nucleotide then is attached to protein, thereby forming an enzyme, and takes its part in oxidation-reduction reactions.

Requirements in Human Nutrition. As we have seen, vitamin B_2 is essential to life. We have no special storage organs in our bodies for this vitamin, although a certain level is maintained in various tissues, with relatively large amounts found in the liver and kidneys.

MEASURING METHODS

In the beginning, riboflavin activity was described in "Bourquin-Sherman units" and requirements were thought to be very small. Subsequent research showed otherwise. Milligrams of weight became the unit and the Food & Drug Administration of the U. S. Dept. of Health, Education & Welfare established (July 1, 1958) a minimum daily requirement of 1.2 mg. of riboflavin for all persons 12 or more years old. For infants it is 0.6 mg. These requirements are designed to prevent the occurrence of symptoms of riboflavin deficiency disease. The minimum daily requirement for this vitamin for children from 1 to 12 years is 0.9 milligram.

Recommended allowances. The Food & Nutrition Board of the National Academy of Sciences—National Research Council, in its 1958 publication #589, recommends the following daily dietary allowances of riboflavin, expressed as milligrams. These are designed to maintain good nutrition of healthy persons in the U.S.A.

Men	1.8
Women	1.5
Women (pregnant; second half)	2.0
Women (lactating)	2.5
Infants (2 to 6 months)	0.5
Infants (7 to 12 months)	0.8
Children (1 to 3 years)	1.0
Children (4 to 6 years)	1.3
Children (7 to 9 years)	1.5
Children (10 to 12 years)	1.8

	Boys	Girls
Adolescents (13 to 15 years)	2.1	2.0
Adolescents (16 to 19 years)	2.5	1.9

False Claims Charges Denied By Safeway Stores

WASHINGTON — Safeway Stores, Inc., one of the nation's major supermarket chains, has denied Federal Trade Commission charges of making false weight control claims for its Slender-Way Bread.

Answering the FTC's complaint, Safeway asserts that a "slice of Slender-Way Bread has fewer calories than a slice of ordinary bread because Slender-Way Bread is sliced thinner." It alleges that consumers "measure their bread consumption by slices rather than by loaves or pounds so that if they eat a stated number of slices of Slender-Way Bread they consume fewer calories than they would have consumed had they eaten the same number of slices of ordinary bread."

The company stated further that the bread "has a lower caloric content than many other foods so that by using Slender-Way Bread in place of higher calorie foods, persons may reduce their total caloric intake."

The FTC's complaint alleged that Slender-Way Bread is not a low-calorie food, does not have less calories than ordinary bread, and eating it will neither cause weight reduction nor prevent its gain. It also charged that the name "Slender-Way" is in itself misleading.

Denying any deception in either the advertising or brand name, Safeway declares it has been producing Slender-Way Bread for the past eight years "without receiving complaints from consumers that they were in any way misled or deceived as to its caloric content."

The company asks dismissal of the FTC's complaint.

R. R. Gardner

TO RETIRE—R. R. Gardner, a sales representative with the San Francisco sales division of Bemis Bro. Bag Co., was retired on Nov. 1 after 48 years of service with the organization, it was announced by A. H. Silvernail, Jr., regional sales manager, San Francisco. Mr. Gardner, long active and respected in the bag industry, joined Bemis in 1911 as a clerk in the credit department at the company's San Francisco plant. In 1942 he joined the Bemis San Francisco sales division and was assigned special duties in seed packaging. Mr. Gardner has been an active member of the Masonic, Shrine and Elks organizations.

# of VITAMIN B_2

(Riboflavin)

by Science Writer

Deficiencies of vitamin B_2 appear in several ways in human beings. The eyes, the skin, the nerves, and the blood show the effects of too little riboflavin. Laboratory animals have demonstrated that a riboflavin-deficient diet can cause death of adults and can slow or stop growth in the young. Female animals, deprived of riboflavin in the diet, may produce offspring with congenital malformations.

Medical uses. To overcome and control deficiencies in human beings, physicians have pure riboflavin available for administration by injection or orally, by itself or with other "B" vitamins or multi-vitamin-mineral combinations.

How do we get our daily riboflavin? Vitamin B_2 has wide distribution throughout the entire animal and vegetable kingdoms. Good sources are milk and its products, eggs, meats, legumes, green leaves and buds. Whole-grain cereals have significant but not large amounts of riboflavin.

ADDITION TO FOODS

Cereal foods play a large part in our diet. To produce the white flour almost all of us want, millers are obliged to remove parts of the wheat that contain much of the grain's riboflavin and other nutrients. In addition, cereal grains are not rich sources of riboflavin. Millers meet this problem by *enriching* the grain foods for which federal standards exist with vitamins B_1, B_2, niacin and the mineral iron. In the case of vitamin B_2, however, they do more than *restore* the processed food to its natural riboflavin level; they *fortify* the food with enough of this essential vitamin to make it nutritionally more valuable than it was in nature.

Acting to protect the good health of millions of Americans, bakers and millers adopted *enrichment* of white bread and white flour in 1941. Since that time, other foods, such as macaroni products, corn meal and grits, farina, pastina and breakfast cereals have had their food value increased by enrichment with pure riboflavin and other vitamins and minerals.

When enriching, fortifying or restoring, food manufacturers add the necessary quantity of riboflavin (and other vitamins and minerals) to the food during processing, so that the finished product meets federal, state, and territorial requirements or contributes to the consumer an amount of the vitamin that dietary experts believe significantly useful.

PRODUCTION

Prof. Karrer's synthesis of riboflavin was a laboratory success. Adapting the process to commercial production, however, demanded original thinking by chemists at Hoffmann-La Roche. The production of riboflavin by chemical synthesis requires the production of ribose, a rare sugar, at an early stage in the process. This special sugar must be made inexpensively if the synthesis is to be practical. Sugar chemistry is a difficult matter. In a brilliant piece of work, the Roche chemical experts developed a method to produce ribose on a commercial scale by an electrolytic process, thus overcoming a most troublesome problem. Subsequently, Roche chemists developed the first practical synthesis for riboflavin-5′-phosphate, identical with natural flavin mononucleotide.

Picture three streams joining to form a river and you have a simplified idea of the Roche process for synthesizing vitamin B_2. O-xylene and glucose are processed separately to form xylidine and ribose respectively. These are joined to form ribitylxylidine, which is then converted to ribitylaminoxylidine. Starting separately with malonic ester, which is processed through intermediate stages to alloxan, the third "stream" is then joined with ribitylaminoxylidine to form riboflavin. Purification occurs at each step of the synthesis. Riboflavin Roche* equals or exceeds U. S. P. standards.

By the tons. So efficient is the Roche process that pure riboflavin is produced *by the tons* for use in pharmaceutical products and processed foods. An interesting development by Roche is the production of riboflavin in different forms related to the method of end use. Roche* Regular riboflavin U. S. P. is especially useful in dry enrichment premixes, powdered dietary supplements, pharmaceutical tablets and soft gelatin capsules. Roche* Solutions type is preferred for the manufacture of solutions having low concentration. Roche* Riboflavin-5′-Phosphate Sodium is a highly and rapidly soluble riboflavin compound favored for all pharmaceutical liquid products and some tablets, lozenges, and capsules. It has a more pleasant taste than the bitter U. S. P. riboflavin.

This article is published in the interests of pharmaceutical manufacturers, and of food processors who make their good foods better using pure riboflavin Roche.* Reprints of this and others in the series will be supplied on request without charge. Also available without cost is a brochure describing the enrichment or fortification of cereal grain products with essential vitamins and minerals. These articles and the brochure have been found most helpful as sources of accurate information in brief form. Teachers especially find them useful in education. Regardless of your occupation, feel free to write for them. Vitamin Division, Hoffmann-La Roche Inc., Nutley 10, New Jersey. In Canada: Hoffmann-La Roche Ltd., 1956 Bourdon St., St. Laurent, P. Q.

High Plains Decline In Yields of Wheat Credited to Virus

AMARILLO, TEXAS—Dr. Lee J. Ashworth, assistant professor in the department of plant physiology and pathology at Texas A&M College, has reported that some reduced wheat yields of the past season in the High Plains area are now considered to have been due partly to wheat streak mosaic.

The virus was transmitted successfully from diseased wheat plants collected in Lipscomb County, Texas, by H. H. McKinney, U.S. Department of Agriculture. Dr. Ashworth also found diseased plants in Potter and Deaf Smith counties. He stated that virus transmission studies show the wheat streak virus is harbored by at least five native grasses.

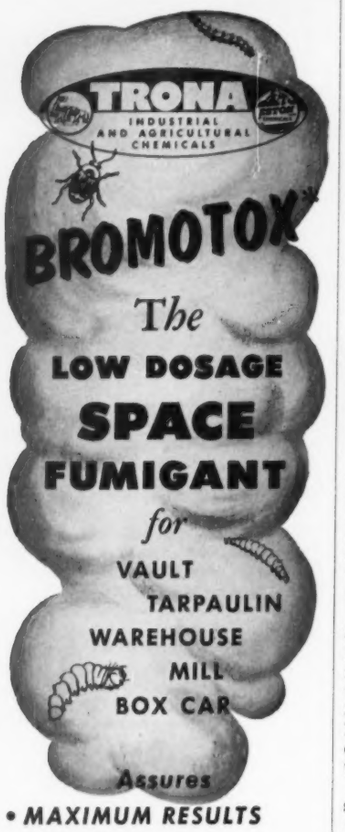
A mite insect, so small that it cannot be seen with the naked eye, is believed to be a carrier of the virus. This insect has been found on sandbur plants of the High Plains.

——BREAD IS THE STAFF OF LIFE——

Clupak Production Started in Louisiana

NEW YORK—At its Hodge, La., paper mill, Continental Can Co., Inc., has started up production of "Clupak" paper, announced G. E. Amerman, president of Clupak, Inc.

Continental Can's "Clupak" extensible paper unit has been installed on its No. 4, 246-in. wide machine, which has a production capacity of approximately 250 tons a day, and will produce "Clupak" paper for general converting purposes, with special emphasis on multiwall sacks.



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TERMINAL ELEVATOR PROPOSAL DECLINED

SASKATOON, SASK. — United Grain Growers, Ltd., will not construct a terminal grain elevator at a Newfoundland port. This had been suggested earlier by the Hudson Bay Route Assn. A letter to the secretary of the association from J. A. Brownlee, UGG president, said his company was not in the export grain business and would confine its storage facilities to the lakehead and western provinces.

Pfizer Sales Up, Earnings Steady Report Shows

NEW YORK—Sales of Chas. Pfizer & Co., Inc., in the first nine months amounted to $185,671,622, an increase of slightly more than 15% over the $160,395,131 reported in the same period last year, share owners were told in the interim statement issued recently.

Net earnings were $17,240,735, or $1.05 per share of common stock on 16,306,510 shares outstanding at the end of the period. This compared with last year's nine-month total of $17,228,615, or $1.06 per share on 16,115,928 shares outstanding, adjusted for the three-for-one split effective April 21.

About one half of the $25,276,491 sales increase, the report said, is attributable to the volume of companies acquired toward the end of last year.

Third quarter sales rose to $62,773,099 from $53,451,862 in the June-September period last year. Net earnings were $5,843,837, or 36¢ per share, against $5,645,845, or 35¢ per share on an adjusted basis, in the same quarter in 1958.

In a message to share owners, John E. McKeen, president, said the firm's plants around the world are generally operating at capacity.

"We anticipate that the year-to-year gain in sales will continue for the balance of 1959 and we hope that the fourth quarter will see an improvement in earnings," he declared.

—BREAD IS THE STAFF OF LIFE—

Wheat Pool Erecting All-Steel Elevator

REGINA, SASK. — The Saskatchewan Wheat Pool has begun erecting steel at Kenaston, about 115 miles northwest of here on the highway to Saskatoon, for Western Canada's first all-steel grain elevator. The new elevator will be 111 ft. in height with a 60,000 bu. capacity.

The only welding in the entire structure is along the base, where a plate is welded to steel previously set in concrete . All plates, braces, supports and other materials have been prefabricated. Technical advice on construction is being provided by representatives from a steel erection firm from Tacoma, Wash. Part of the steel had to be imported from the U.S.

—BREAD IS THE STAFF OF LIFE—

Prairie Aid Delayed

OTTAWA — John Diefenbaker, prime minister, said here Oct. 29 that any statement on federal government aid to prairie farmers with unharvested grain lying under a heavy blanket of snow would not be forthcoming until detailed information was available. The government would then consult with the three western provinces concerned, he stated.

ANIMATION—Discussing mill affairs at the joint AOM-AACC meeting in Montreal are left to right: Ed Cecka, MMC Sales Corp.; Roy F. Kehr, Kressilk Products, Inc., District 8 secretary-treasurer; Richard Evans, St. Regis Paper Co., and Robert Van Burek, Wallace & Tiernan, Inc.

California Truckers Ask for Lower Rates

SAN FRANCISCO—In a surprise move during the present controversy in California regarding the establishment of new trucking rates, a group of California truckers has filed a petition with the state Public Utilities Commission for lower rates for the transportation of grain and grain products. Eight truckers in the state are involved.

The petition presents the following points for lower rates: Prescribed rates are "unjust, unreasonable and excessive; will result in substantial increase in proprietary transportation; cost studies of the PUC do not reflect current methods and equipment improvements; significance of the public hearings held was not fully appreciated by many truck carriers and they should be given another chance; the trucking association does not represent all the truckers in the state, and efficient truckers have been able to maintain their operations in the face of increased costs due to their skill and knowledge in providing service in grain hauling."

Unless the PUC decides to make a change, the existing order to raise the rates will go into effect on Nov. 13. Several trade groups have filed a joint petition with the commission on a rehearing to stop the order. Cooperating associations include the San Francisco and Los Angeles Grain Exchanges and the California Hay, Grain & Feed Dealers Assn.

—BREAD IS THE STAFF OF LIFE—

M. J. GREELY DIES

GREAT FALLS, MONT.—Myril J. Greely, prominent local business man, died recently following a heart attack. He was president of Greely Elevator Co. and for many years was active in business, civic, fraternal and social affairs. Mr. Greely was born at Kimball, Minn. He was the son of W. T. Greely, a Montana pioneer, and came to the state as a child. He had made his home in Great Falls since 1914.

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Soil Bank Requests Nearly Double Goal

WASHINGTON—The U.S. Department of Agriculture has announced receipt of nearly 103,000 applications to place a total of 9.6 million acres in the Soil Bank Conservation Reserve beginning in 1960, almost twice the national acreage goal. The deadline for filing applications was Oct. 16 in all states.

It will not be possible to accept all of the acreage offered for 1960 contracts. The department estimated when the signup began last summer that approximately 5.1 million new acres could be taken into the Conservation Reserve with available funds. Present indications are that a somewhat larger acreage than this original goal can be accepted, USDA states.

Since the acreage of 1960 applications exceeds the new acreage that can be contracted for at this time, the "best buy" priority system previously announced will be used in states and counties to determine which applicants can be offered contracts.

A basic per-acre rate was established for each farm for which a contract was requested. In applying the priority system, the general order of acceptance will be on the basis of offers at the lowest percentage of the basic rate for the farm. Applicants who were not offered 1959 contracts because of lack of funds have a special priority for 1960.

The Conservation Reserve of the Soil Bank is a voluntary production adjustment program under which farmers sign contracts to withdraw cropland from production for a period of years and devote the land to grass or trees or to water or wildlife conservation. Under these contracts, the government agrees to share the cost of establishing the conservation practice and to make annual rental payments on the designated land for the contract period.

During the 1956-59 period, a total of about 246,000 farmers have placed 22.4 million acres in the reserve. Approximately 14.7 million of this is in whole-farm contracts, under which all the cropland on the farm is retired from production, USDA reports.

—BREAD IS THE STAFF OF LIFE—

W. D. Roth Named To Represent Merck In Southwest States

RAHWAY, N.J.—Warren D. Roth has been named a southwestern general products sales representative for Merck Chemical Division. He will serve southern California, Arizona, New Mexico and western Texas, according to Richard W. Hayes, director of marketing for Merck general products at Rahway.

Mr. Roth will report to Arthur C. Dodds, senior sales representative for Merck general products in San Francisco. He attended the University of Pennsylvania, Philadelphia, and Idaho State College, where he received his bachelor of science degree in pharmacy and chemistry. Mr. Roth is a registered pharmacist.

Previously, Mr. Roth worked as a field sales representative in Idaho, Washington and Oregon from 1951 to 1952 and as a sales service supervisor in the Merck Pacific Coast branch at Los Angeles between 1952 and 1959.

Algae May Become Useful Products Source

WASHINGTON — The fresh-water algae which produce scum on farm ponds and lakes may eventually supplement food and forage products and become a new source of vitamins, animal feed, fertilizer and other organic products useful to man, according to new findings of U.S. Department of Health, Education and Welfare Public Health Service scientists.

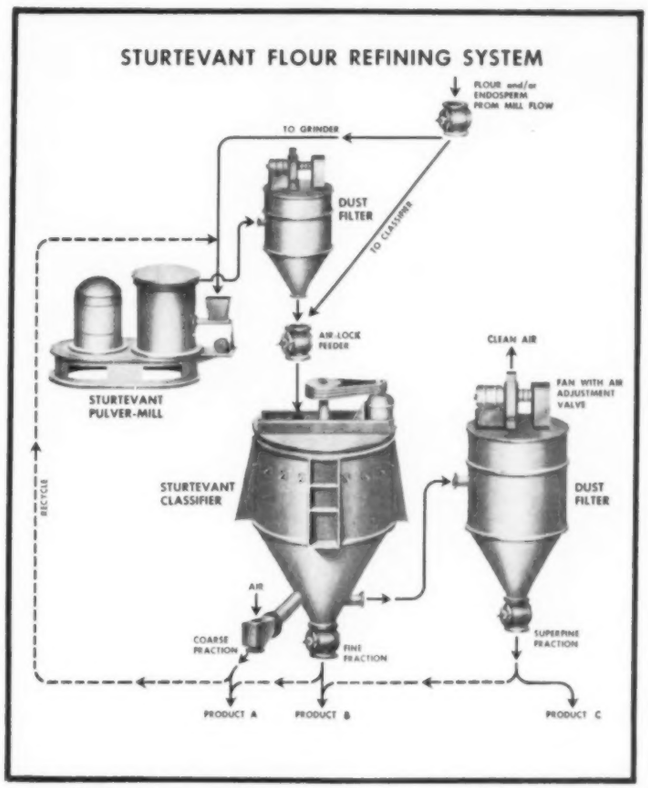
Certain of the so-called good types of algae may prove useful in commercial products, according to findings recently reported in an illustrated manual, "Algae in Water Supplies."

Designed primarily for water plant operators, the manual identifies the types of algae associated with clean and polluted water, and explains how they may help or hinder production of good quality water.

The role of algae in sewage treatment has become increasingly apparent in recent years, according to the manual. With algae it is possible to support immense populations of aerobic bacteria, and thus accelerate the sewage stabilization process. It is the growth of algae developed in sewage stabilization ponds that advancing technology may some day be able to convert into useful products.

The new algae report is the result of an eight-year study by two scientists at the Public Health Service's Sanitary Engineering Center in Cincinnati—Dr. C. M. Palmer, algologist, and Harold J. Walter, biologist and artist. The 100-page study, with six color plates and many black-and-white drawings, is for sale for $1 by the Superintendent of Documents, Government Printing Office, Washington, D.C.

New Sturtevant Flour Refining System is Highly Flexible, Makes Precise Separations



Key to the Sturtevant Refining System shown above is a Sturtevant Air Classifier which can produce 3 kinds of flour in one operation. Both the Pulver-Mill and the Air Classifier have exceptionally large capacities.

For protein shifts... Primary classifications.. Coarse or fine separations for new end products

Sturtevant's new flour refining system is the result of 44 years of experience engineering classification systems for food and other industries.

Heart of the special system is a Sturtevant Air Classifier which classifies coarse, fine and superfine fractions. Low volume of air requirements means smaller dust filters. Thus savings in both space and costs are effected.

The Classifier makes precise selections of end products by means of exact control of air currents and centrifugal force. Simple adjustments in counter action between these two forces permit the receipt of almost any desired particle size.

Operation of Sturtevant's new flour refining system is highly flexible. The Pulver-Mill and Air Classifier can be used singly or together, in accordance with individual grinding-classifying needs.

CALL ON STURTEVANT to help you upgrade your milling system while lowering production costs. Sturtevant Flour Refining Systems offer much higher output capacities than are available elsewhere, yet require only 1/3 as much capital investment.

Write today describing your requirements. A Sturtevant engineer will be happy to make recommendations based on 44 years' successful experience with grinding-classifying problems. Address your letter to *Grain Processing Division, Sturtevant Mill Company, First National Bank Bldg., Fostoria, Ohio.*

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Clifford R. Hope Cites Food's Role In World Struggle

BEATRICE, NEB.—"America would be living in a world much less to its liking today if U.S. farmers were not so productive," Clifford R. Hope, president of the Great Plains Wheat Market Development Assn., stated at the annual Nebraska Wheat Show held here.

Mr. Hope gave credit to food as being "our most effective weapon against the spread of world Communism." He said that the U.S. has operated a number of foreign aid programs since the end of World War II, "under which programs a substantial part of our contribution to the economy of other countries has been in the form of surplus agricultural commodities." There are many of us who feel that more can and should be done, he added.

"Hungry people everywhere are desperate people," said Mr. Hope. "They are potential makers of war, for they are willing to listen to the blandishments of anyone who will promise something better than their present misery."

"Our world today would be a much less desirable place had America been unable or unwilling to use excess food supplies to feed hungry people. We can only ask ourselves what the situation might have been if Russia, instead of the U.S., had possessed and used these food supplies as an instrument of foreign policy," he stated.

Russian Plan

Mr. Hope explained how Russia tells underdeveloped countries that Communism offers the only opportunity to industrialize. But the Russian plan calls for state ownership of the production machinery. Workers are paid a pittance for their work, and the resulting profit is used for development and industrialization.

"Russia's achievements along this line have made their argument fairly effective," Mr. Hope said. "But it is no answer to the Communist argument to say that the plan won't work. We must show that we have something better."

That "something," he pointed out, is Public Law 480 under which surplus farm commodities are sold overseas for local currency. The law makes it possible for underdeveloped nations to secure food which they need. This currency then can be loaned to these countries for industrialization.

Another important part of Public Law 480 is its provisions for market development. The law provides that a small portion of funds from these sales can be used by U.S. farm groups to build and expand markets.

Market Development

"We know that markets do not develop themselves," Mr. Hope said. "That is why growers and wheat commissions in Nebraska, Kansas, and Colorado joined to form the Great Plains Wheat Market Development Assn."

The association is working on a variety of projects designed to carve out a larger share of the world market for Great Plains wheat. It has opened up a network of offices over the globe, sent teams of experts to survey markets, and hosted missions from a dozen different countries.

"Our efforts are meeting with success," Mr. Hope said. "We have seen enough results to convince us that we are on the right track," he concluded.

VISITOR—Mrs. H. K. Philip of New Delhi, India, on a visit to Fisher Flouring Mills Co., Seattle, witnessed the preparation and packaging of Fisher's Ala and Old World Wheat Pilaf, wheat products cooked and served like rice. Mrs. Philip spoke enthusiastically about the possibilities of improving Indian diets and making menus more interesting with American wheat in this new form.

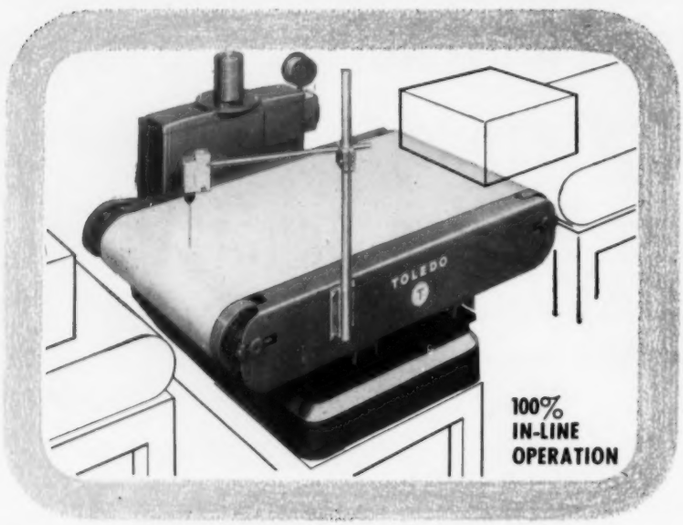
CANADIAN WHEAT TO AFRICA

OTTAWA—For the second successive year South Africa has purchased 4,480,000 bu. wheat from Canada. Shipments of the latest purchase, announced here by the South African high commissioners' office, will take place in 1960 and be completed before the close of the present crop year next July 31. A small crop, due to drouth conditions, prompted South Africa to purchase the Canadian wheat. It will move out under terms of the International Wheat Agreement.

MALATHION TREATMENTS PROTECT STORED CORN

★

WASHINGTON — Malathion emulsion sprays were found to be superior to methoxychlor dusts in protecting shelled corn stored in the southeast from insect attack, according to a report issued by the U.S. Department of Agriculture. This report presents the results of exploratory field tests conducted by USDA's Agricultural Marketing Service on various dosages of malathion emulsion sprays and methoxychlor dusts used as protective treatments against insect infestations. A free copy of this report, "Tests with Malathion and Methoxychlor Protective Treatments for Shelled Corn Stored in Metal Bins in the Southeast," Marketing Research Report 357, may be obtained from the Office of Information, USDA, Washington 25, D.C.



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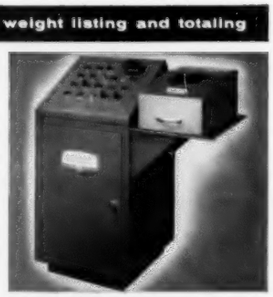

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PL 480 Deals With Yugoslavia, Pakistan Announced

WASHINGTON—The U.S. Department of Agriculture has announced the extension of contracting and delivery periods for wheat purchase authorization No. 11-25 to Yugoslavia and issuance of three new authorizations for wheat or wheat flour to Pakistan, all under Title I of PL 480.

The contracting and delivery periods of authorization No. 11-25 to Yugoslavia have been extended from Oct. 31 and Nov. 30, 1959, to Nov. 30 and Dec. 31, 1959, respectively.

Authorization No. 11-25 provides for the purchase of $46 830,000 worth of wheat. About 50 000 metric tons remain to be purchased.

Purchase of about 700,000 metric tons of the wheat has been completed, and this wheat will be shipped within the original delivery period. The extension of the terminal dates was at the request of Yugoslavia. Additional time is required because of shipping difficulties. The government of Yugoslavia advises that the remainder of the wheat will not be purchased until seven days after the announcement of this amendment.

Purchases will be made by "Granexport," 8-10 Bridge St., New York 4, N.Y. Inquiries also may be directed to V. Ristic, 1600 Massachusetts Ave., N.W., Washington 6, D.C.

Authorization No. 15 53 to Pakistan provides for the purchase of $158,890 worth, or about 2,580 metric tons of wheat, Grade U.S. No. 2 or better, in bulk, or flour, under an agreement with Pakistan announced Nov. 15, 1957.

Authorization No. 15 52 provides for the purchase of $274 325 worth, or about 4 460 metric tons of wheat Grade U.S. No. 2 or better, in bulk, or flour, under an agreement with Pakistan announced Nov. 28, 1958.

Only the following wheat will be eligible for financing under the foregoing authorizations: (1) hard red spring of the subclasses dark northern spring, northern spring and red spring; (2) hard red winter of the subclasses dark hard winter, hard winter and yellow hard winter, and (3) mixed wheat containing not more than 5% of the classes (excluding durum) other than the classes specified in (1) and (2).

Flour milled from the following wheat will not be eligible for financing: (1) durum of the subclasses hard amber durum, amber durum and durum, and (2) red durum.

Authorization No. 15-51 to Pakistan provides for the purchase of $617,300 worth, or about 10,355 metric tons of white wheat of the subclasses hard white, soft white, white club, and western white, Grade U.S. No. 2 or better, in bulk, or flour (excluding flour milled from red durum and durum—durum wheat includes the subclasses hard amber durum, amber durum and durum).

In the case of authorizations Nos. 15-51, 15-52 and 15 53, sales contracts made between Nov. 5, 1959, and May 31, 1960, will be eligible for financing. Delivery will be to importer f.o.b. vessel, port of exportation, with respect to wheat, or f.a.s. vessel, U.S. ports, with respect to flour. Shipments from U.S. ports may be made between Nov. 5, 1959, and June 30, 1960.

Wheat exported must have been grown in the U.S., and the flour exported must have been milled in the U.S. from domestically produced wheat.

Rail Merger Urged As End to Repeated Freight Rate Hikes

BUFFALO—A Chicago industrialist has urged the Interstate Commerce Commission to approve the proposed merger of the Erie and the Delaware, Lackawanna & Western railroads, saying he hopes the economies that can be effected may end a 13-year round of freight rate increases.

John R. Staley, vice president of the Quaker Oats Co., testifying at an ICC hearing in Hotel Buffalo on the proposed Erie-Lackawanna merger, said he was "tired" of railroad freight increases.

Asked by Hyman J. Blond, ICC examiner, whether the merger would mean anything to Quaker Oats so far as savings are concerned, Mr. Staley said it is his understanding that the Erie and Lackawanna can trim their costs by $13 million a year by merging their operations.

"So, perhaps we wouldn't have any more (rate) increases," Mr. Staley said. "We have had our freight rates increased 15 times in the last 13 years and we are tired of such increases. In the last ten years, we have shipped 75,428 carloads of freight over these two railroads (the Erie and Lackawanna), and, therefore, we have a substantial interest in anything which affects their operation," he stated.

—BREAD IS THE STAFF OF LIFE—

FIRE DESTROYS BAKERY

LITTLE ROCK, ARK.—Helm's Bakery in Little Rock was destroyed by a fire recently. Officials estimated damage at $50,000. Cause of the fire was undetermined.

TWENTY-TON LOAD aboard trailer fails to bother multiwall sack made with CLUPAK kraft. Patented, built-in stretch absorbs shock as wheels pass completely over. Sack contains 100 pounds of abrasive sand-blasting grit, found difficult to package prior to use of CLUPAK paper multiwalls.

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USDA Reports Trends In Fats, Oils Industry

WASHINGTON—The shift in recent years to high-speed screw-press and solvent extraction in the oilseed industry has increased the yield of vegetable oils in the U.S., according to a research report issued recently by the U.S. Department of Agriculture.

The improved methods yield about 30 lb. more cottonseed oil per ton than the older hydraulic method. Today more than four fifths of all cottonseed is processed by the high-speed screw-press or solvent methods of extraction, according to the report. In 1952-53 less than one third of the cottonseed was processed by these methods. More than nine tenths of the soybeans have been processed, in recent years, by the solvent method of extraction.

Despite an 18% increase in oilseed crushings between 1952-53 and 1957-58, the capacity of the industry still substantially exceeds the supply of seeds for crushing. Processing plants have been getting fewer, but larger.

The study is part of a research program by the Agricultural Marketing Service to improve efficiency and reduce costs in marketing farm products. A copy of the report, "Capacity and Processing Trends in the Fats and Oils Industry," Marketing Research Report No. 360, may be obtained from the Office of Information, U.S. Department of Agriculture, Washington 25, D.C.

—BREAD IS THE STAFF OF LIFE—

500,000 Viewers Visit Board's Exhibit

MEMPHIS, TENN. — Memphis Board of Trade had a display at the annual Mid-South Fair in Memphis, and Arthur A. Williams, executive vice president, estimates that more than half a million people viewed it.

A feature of the display was the showing of films on grains and handling of grain through use of an Addamatic machine.

The Board of Trade gave away booklets on harvesting and care of grains. Thousands of these were accepted by people stopping to see the exhibit.

The Inspection Department of the Board of Trade had on display various equipment used in the grading of grains. John Richter, member of the department's staff, was on hand to answer questions and explain about the various facets of the exhibit.

—BREAD IS THE STAFF OF LIFE—

Dr. H. H. Hannam Canadian Advisor To FAO Conference

OTTAWA — Dr. H. H. Hannam, president and manager director of the Canadian Federation of Agriculture, has been appointed agricultural advisor to the Canadian government's official delegation to the 10th session of the Food and Agriculture Organization of the United Nations which opened in Rome Oct. 31. Dr. Hannam has attended every FAO conference, including the first exploratory one called by President Roosevelt in Hot Springs, Va., in 1943.

Dr. Hannam is the only non-government member of the Canadian delegation. Following the FAO session in Rome he will attend the 11th general session of the International Federation of Agricultural Producers in New Delhi, India, and will head up the Canadian delegation. The United Grain Growers, Ltd., and the three wheat pools of Western Canada are all members of the Canadian Federation of Agriculture.

—BREAD IS THE STAFF OF LIFE—

Joins Screw Conveyor As Controller

HAMMOND, IND. — The appointment of Ernest E. Harroun as controller of both Screw Conveyor Corp., Hammond, and its wholly-owned subsidiary, Screw Conveyor Pacific Corp., Santa Clara, Cal., has been announced by Russell B. Maas, president and general manager.

Ernest E. Harroun

Mr. Harroun was formerly accounting manager and division controller of the Luria Engineering Co., division of Luria Steel & Trading Corp. Prior to that he was chief accountant of the Strich Trailer division of Fruehauf Trailer Corp. He will make his headquarters at the general offices of Screw Conveyor in Hammond.

MNF CONVENTION DATES IN 1961

CHICAGO—Officials of the Millers National Federation have confirmed the time and place of the 1961 annual convention of the organization. It will be held April 23-26 at the Shoreham Hotel in Washington. The hotel is being renovated and a drive-in court now adjoins the main building. The 1960 convention will be held at the Edgewater Beach Hotel, Chicago, May 8-11.

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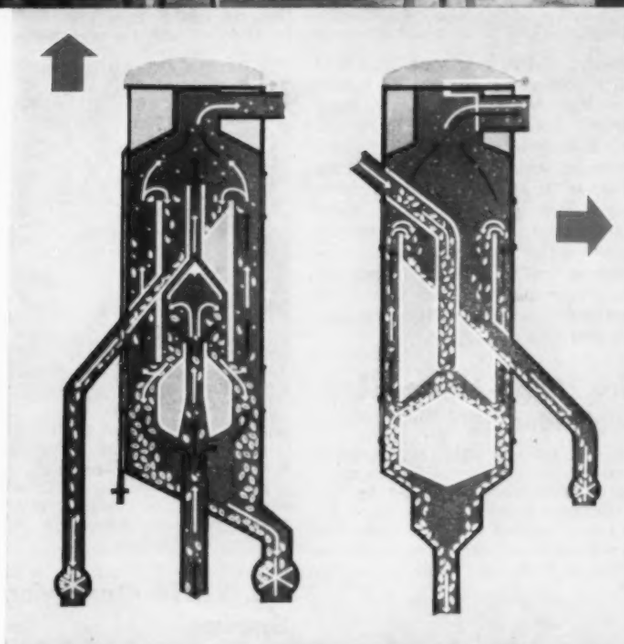

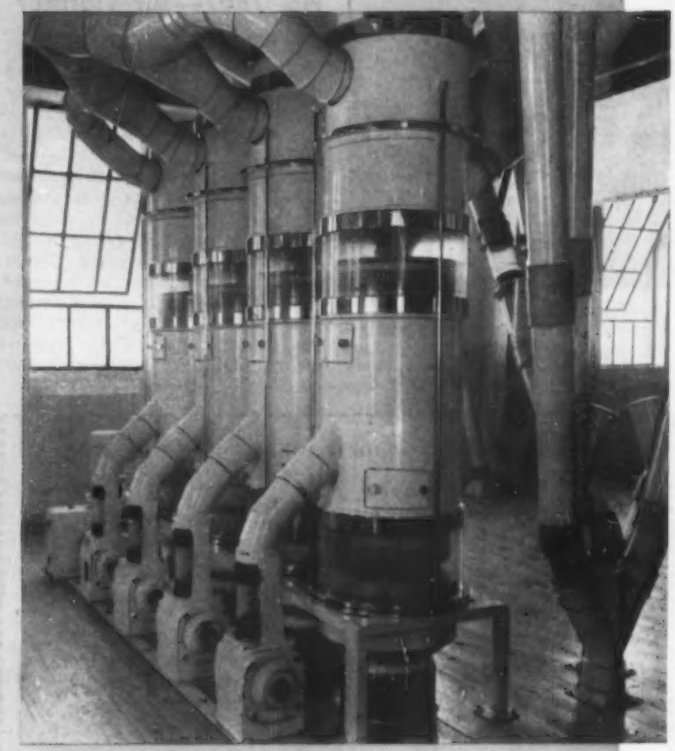

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Worth Looking Into

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New Services
New Literature

This reader service department announces the development of new and improved products, new services and new literature offered by manufacturers and suppliers. Claims made in this department are those of the firm concerned. Use the accompanying coupon to obtain the desired information.

No. 7609—Temperature Systems Literature

Hot Spot Detector, Inc., announces the release of illustrated installation literature on the Hot Spot Detector

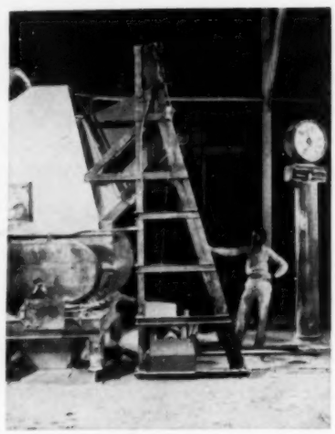
Temperature Systems for flat storage. The publications picture and detail installation procedures for factory fabricated temperature systems in straight sidewall steel storage buildings, wonder buildings and corrugated metal bins. The publications are in color. Hot Spot systems vary from small singular units to automatic digital recording scanners, the company said. For copies of the literature, check No. 7609 on the coupon and mail.

No. 7607—Air Vibrator Bulletin

The National Air Vibrator Co. announces the availability of a four-page bulletin detailing applications of its one-piece air vibrator. Vibrator models are illustrated operating successfully in hazardous atmospheres, extreme moisture conditions, outside in severe weather and in magnetic dust conditions, the company said. Specifications and mounting information on eight models are included. The vibrators are used for moving bulk materials through hoppers, bins and chutes. Copies of the brochure can be obtained by checking No. 7607 on the coupon and mailing.

No. 7611—Materials Handling Unit

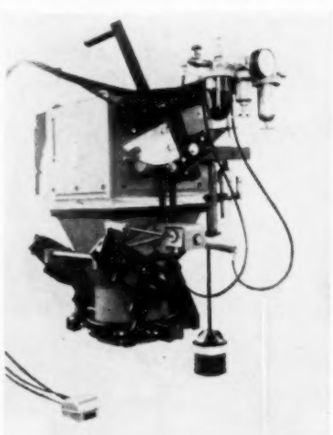
A dumper that lifts and dumps complete implant bulk trucks has been introduced by Conveyors & Dumpers, Inc. The unit is designed for rapid, low-cost batch loading and mixing, grinding and pulverizing ma-



chinery or kettles, tanks, vats and other process equipment. It permits the truck to be filled and weighed remote from the receiving vessel. The dumper is available in capacities up to 3,000 lb. and dumping heights to 50 ft. It is furnished in portable and stationary models. Although of standardized design, it can be varied to accommodate almost any size truck as well as a variety of containers, the company said. For further information, check No. 7611 on the coupon and mail.

No. 7677—Automatic Bagholder

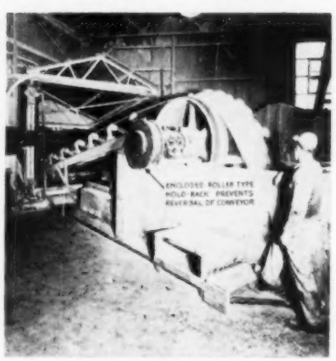
Dust-tight operation and increased productivity are claimed for an automatic bagholder introduced by the Richardson Scale Co. The dust-tight closure is applied to the lip of the bag to prevent dust from flying up as material is discharged. Foot pedal air-



operation leaves the operator's hands free, the company said. The bagholder is adapted to both the semi-automatic Richardson G-17 gross bagger and the GA-17 gross bagging scale. Both the G-17 and the GA-17 have oval bag spouts and are designed for filling either open-mouth textile or multi-wall paper bags with capacities in the range 10 to 140 lb., the company said. For further information, check No. 7677 on the coupon and mail.

No. 7690—Conveyor Holdbacks

Stephens-Adamson Manufacturing Co. announces development of two types of holdbacks, a standard roller type holdback and a totally enclosed type holdback, designed to protect personnel and equipment from reversal of conveyors and elevators. The standard roller type is designed to give protection to bucket elevators and inclined conveyors. According to company literature, with the installation of this unit on the head shaft, a conveyor or elevator can be stopped at any time without the danger of the load traveling backward. The unit features a balanced design with no ratchet. It operates on the roller wedge principle, so that when power is interrupted, or when the belt makes the slightest move backwards, the rollers wedge between the drum and wedge-plate, preventing reversal. It is available in bore sizes 1-7/16 in. to 8 in. The totally enclosed holdback features a cast steel housing hardened wedge block and hardened steel rollers. It was designed for protecting inclined conveyors and bucket elevators. If power fails and the shaft tends to reverse, the steel rollers en-



gage instantly. The unit releases freely when forward travel is resumed. The totally enclosed design prevents entry of dust, dirt and foreign matter, the company says. For more information, check No. 7690 on the coupon and mail.

No. 9121—Conveying Systems

Power-Curve Conveying Co. has issued new literature on a new conveying surface which it claims has at least three times the service life of previous materials. The new 1960 model car loaders and bag conveyors use spring steel belts to permit a continuous bag conveying surface which can be swung to right or left for high speed loading of box cars and trucks and for all other bag conveying service. A change in steel analysis and spring manufacturing technique is now used. The new car loader is said to be stronger and simpler, capable of taking greater abuse. With such a loader installation, one man can load without aid at least two box cars an hour, the makers state. For descriptive literature, check No. 9121 on the coupon.

No. 7562—Mixer-Blender

Collision Mixer Co. announces a mass production mixer-blender. The unit is for mixing dry ingredients. Materials are not placed in the mixer, but rather fall through, collide and exit without remaining inside, the company said. The mixers are engi-

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- ☐ No. 7607—Air Vibrator
- ☐ No. 7609—Literature
- ☐ No. 7611—Handling Unit
- ☐ No. 7620—Roller Mill
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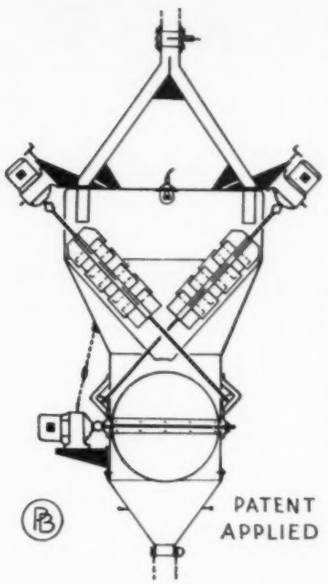
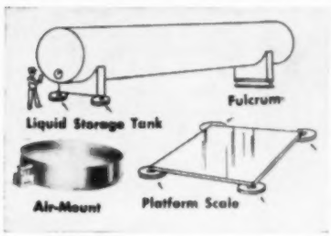


neered for capacities in pounds or tons per minute. For details, check No 7562 on the coupon and mail.

No. 7687—Weighing System

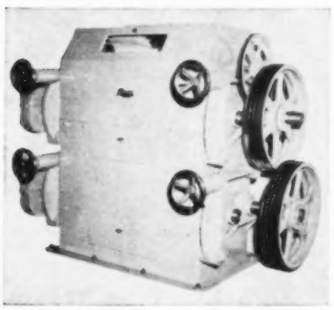
The "Air-Mount Weighing System" for weighing the contents of bins, tanks, truck tanks, conveyor loads and anything that can be weighed on platform scales, has been announced by Weber Air-Weigh Co. The system



is available for loads covering the range from 0 to 300 lb. to 0 to 200,000 lb. According to the company, the units have a repeatable accuracy of better than 1/10 of 1%. The system is operated by a small load-cell placed under each leg of a tank, bin, conveyor system or what have you. Linear pneumatic pressure is automatically controlled in each load-cell and produces a pneumatic signal on a meter, which may be remotely located. Installation time is normally less than one hour, the company says. For literature about the system, check No. 7687 on the coupon and mail.

No. 7620—Hard-grains Roller Mill

A new series of heavy-duty roller mills designed to process soybeans and other hard grains has been added to the line of roller mills made by Ross Machine & Mill Supply, Inc. The new series will make available 24 sizes in four different models. Heart of the design is in a special alloy Turn-Tuff Rolls, deep-hardened and running on oversize roller bearings, the company said. For soybeans, special corrugations are available in reduction multiples of 4-5 to 12-14 corrugations per inch, with differentials to suit. Sizes currently listed in these machines are: 10 by 36, 10 by 42, 2 and 3-pair-high, and in special sizes on order. A complete catalog is available on request. For copies, check No. 7620 on the coupon and mail.



Allis-Chalmers Shows Sales, Earnings Rise

MILWAUKEE — Allis-Chalmers Manufacturing Co. has reported a 34% increase in third quarter sales in 1959 compared with 1958 and a 103% earnings increase for the same period.

R. S. Stevenson, president, said third quarter sales in 1959 amounted to $166,622,772 and earnings, after preferred stock dividend requirements, to $10,034,614.

For the third quarter in 1958, sales were $124,242,243 and earnings amounted to $4,929,106. On a per share basis, the profit in the two comparable quarters amounted to $1.12, compared with 60¢.

First Nine Months

Sales for the first nine months of 1959 amounted to $387,849,262, and for the same period in 1958 to $393,748,854. Profits for the first nine months of 1959 were $15,454,928 compared with $13,646,017 for the first nine months of 1958.

Earnings per share of common stock on 8,934,882 shares outstanding at the end of the period were $1.69. Last year's earnings per share were $1.62 on 8,216,014 shares.

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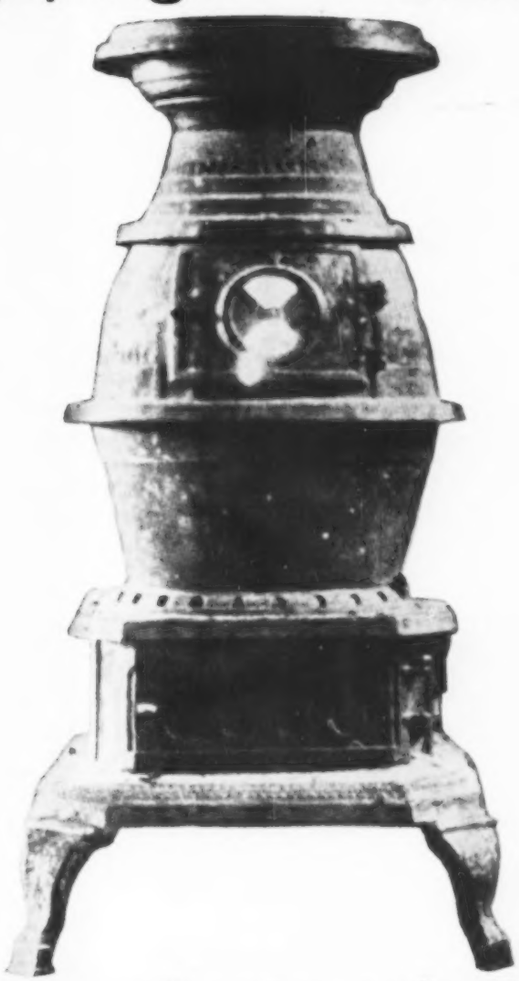

Whatever heats a building could burn it

Mill Mutual Fire Prevention Bureau, 400 W. Madison St., Chicago 6, Ill.
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Closed Circuit Pneumatic Conveying

EDITOR'S NOTE: The accompanying article has been translated from Die Muehle, Detmold, Germany, by Julius Jurkow, Sheridan (Wyo.) Flouring Mills, Inc.

* *

IT is assumed that we are conducting a performance test of a rotary positive displacement blower to which pipes had been connected for the purpose of returning the air discharged from the blower to its intake port.

If we proceed to cut a good-sized opening into the side of the pipe near the discharge of the blower, we should assume that the air would blow out of the opening. But, surprisingly, this will happen only during the start-up period; and as the blower has attained full operating speed, no air will any longer pass in or out of the opening, because the volume of air discharged is equal to the volume entering the intake port of the blower. Nevertheless, something new and unexpected has happened.

If we check at various points with our pressure gauge we will find that at the opening we have zero or equilibrium with atmospheric pressure, and from there on we will find negative pressure, gradually increasing to its highest value at the blower intake where it will now register about double what it had been prior to cutting the opening into the pipe. However, the most important thing discovered will be that now the entire piping system is under negative pressure. Let us assume the opposite case, where the opening had been cut into the pipe near the intake of the blower, and our check will register the highest pressure at the discharge, from where it will gradually decrease to zero at the intake side. The entire piping system will now be under positive pressure.

It was a case in practical operation which led to the discovery of this phenomenon. The chief reason for a closed circuit pneumatic installation is its ability to be operated without a costly filter installation or where the latter would be impractical because of limited space. The air exhausted from a cyclone separator is never entirely free of dust. In a closed circuit system this small amount of residual dust passes through the return piping and blower back to the loading point, where it is mixed into the main stream of material being conveyed.

Some years ago it became a practice in a number of flour mills to convey the several grades of flour from the mill to bulk storage bins by means of closed circuit pneumatic. The main idea was to reduce loss of flour moisture and, as already mentioned, to save the cost of a filtering installation. The positive displacement blowers were placed near the outlets of the cyclone separators or directly on top of them and the flour was fed into the suction pipe leading to the cyclone through one or several rotary air lock type feeders. From the cyclone the flour passed out through another air lock feeder into a conveyor leading to the bins. The return air with residual dust was piped back, under positive pressure to the loading point.

Choke-Up Problem

Operation with this sort of arrangement over various length of time resulted in choke-ups. A search for the cause revealed that a deposit of flour had formed at and near the bottom of the cyclone which had gradually built up to such a thickness as to interfere with discharge of the flour through the airlock. Furthermore, it was observed that these chokes occurred mainly when the system was operating under a reduced load, as in starting or stopping the mill or when a part of the flour was packed off without being included in the main stream transported through the pipes to the storage bins.

In two of the plants the remedy resorted to was a rearrangement of the equipment so as to place the blowers ahead of the air lock feeders at the loading points. The flour was now blown under positive pressure into the cyclone and the return air with residual dust piped back, under negative pressure, to the intake side of the blower. With these alterations having been made, no further choke-ups occurred, even when operation was at a reduced load. However, on returning to these mills after an absence of several months, some very interesting observations were made upon checking the equipment.

Even though the operators were well satisfied with the performance, we were given full opportunity to check the various parts of the installation. Upon removal of a length of pipe of the positive pressure sector, we found its inner surface to be as clean and bright as the inside of a rifle barrel, as was also the inside of the cyclone separator. However, our big surprise came upon inspection of a section of the return or negative pressure piping. This was a pipe of 70 mm. inner diameter in which a thick coating had built up so as to leave an opening of only about 30 mm. in the middle over the entire length of the return pipe. Of particular interest was a look at the

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cross section of this accumulation.

Because in one of the two mills the equipment was used alternately for wheat and rye flour, alternate light and dark rings were observed which resembled growth rings at the severed end of a log.

Here, then, resulted a regular guessing contest as to the cause of this puzzling phenomenon. Because in the first of the two mills the pipes extended across an open courtyard to the bulk storage, it was assumed that the trouble was due to condensation caused by differences in temperature. Because the accumulated stuff had become firm it had to be scraped out, upon which it appeared that the inside of the pipe had become badly corroded, which seemed to confirm our assumption. Nevertheless, our diagnosis was wrong, because in the second mill where a similar installation had been in operation for a like period of time without any noticeable trouble and where the piping did not extend into the open, a like condition was found to exist in the return piping. It was therefore obvious that the cause of the trouble had to be something other than condensation.

Particle Study

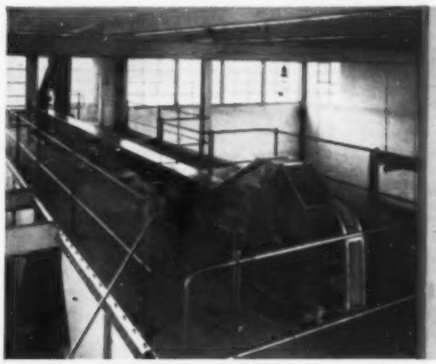
For the sake of explanation let us now consider an individual particle of flour. It is a porous body resembling a sponge, but its shape and structure are well defined, similar to that of a granule of middling, which after all, it is, reduced to very small size. Within its pores the moisture of between 14% and 16% is fairly uniformly distributed as long as the surrounding air remains at normal atmospheric pressure. If such a flour particle is suddenly exposed to positive air pressure, which in the case of pneumatic conveying may amount to 400 mm. to 800 mm. water column, the particle will, because of its firmness of structure, retain its shape and volume. However, the increased pressure will force air into the pores, even if it be for a distance of only a very minute fraction of a millimeter. Along with the air, the moisture will be driven toward the center and the surface becomes drier. This explains the aforementioned bright inner surface of the positive pressure portion of the piping and of the cyclone.

Conversely, as a flour particle suddenly passes into a negative pressure area as existed in the return piping of these installations, an opposite condition is being brought about. The moisture contained in the pores is sucked out to form a pasty surface, which causes the particles to stick to each other and to the inner surface of the piping, thereby causing the troublesome buildup of material.

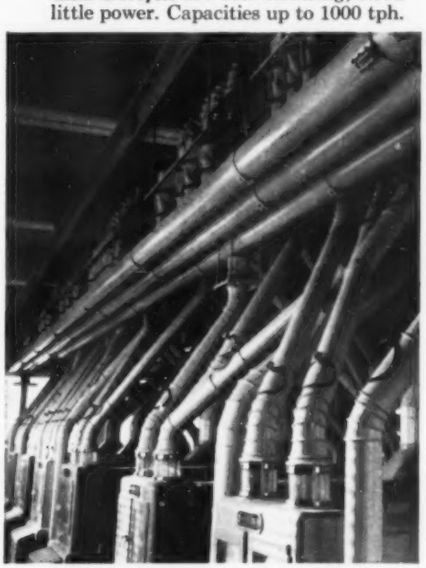
Having arrived at this conclusion, the logical next step was to seek a practical solution which would result in producing positive pressures in both the conveying and return sections of the piping. This was accomplished by proper placement of the zero point (point of equilibrium with atmospheric pressure) in the following manner:

The blowers were placed directly on top of the cyclones and the airlocks at the bottom of the cyclones were omitted. Thereby the cyclone outlet became the zero point of pressure. The blower discharges the air exhausted from the cyclone, including residual dust, into the return piping leading to the point where the flour is fed in through an air-lock feeder and blown into the cyclone. From the cyclone, the flour flows out through the open bottom, dustless and more or less in a sort of fluid state.

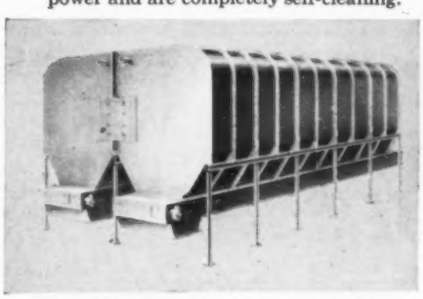
The absence of dusting at the cyclone outlet is explained as follows: The rotation of the blower causes a fixed volume of air, depending on the amount of resistance, to move steadily through the pipes to



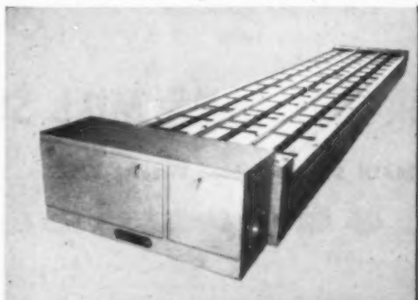
Chain Conveyors are self-cleaning, need little power. Capacities up to 1000 tph.

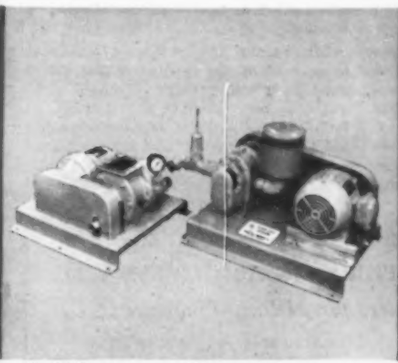


Vibrating Conveyor Tubes require little power and are completely self-cleaning.



Horizontal Storage Bins (above) with **Bin Dischargers** (below) use series of chains for discharge. No bridging; self-cleaning. They are available in a wide variety of sizes to fit the space which you have.





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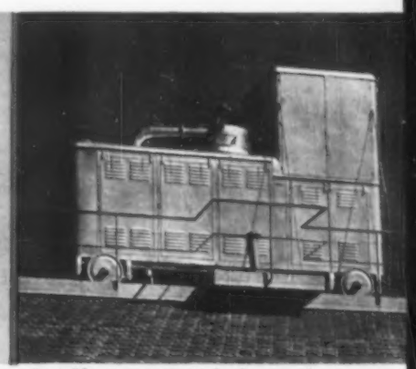

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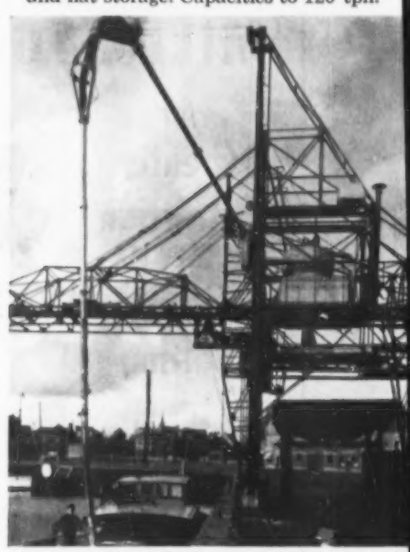

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the loading points, and from there through the cyclone back again to the blower. At the loading point there is a small loss caused by displacement of air by the volume of the load and leakage of air through the vanes of the feeder. An equal volume of make-up air is drawn upward through the bottom opening of the cyclone, effectively preventing escape of floating dust at this point.

In both mills, the flour conveying systems were accordingly rearranged and the equipment rechecked at fairly long intervals. There is no longer any accumulation of material in the piping or any other sort of malfunction of the systems. Both installations have now been in operation for a number of years, and there are quite a number of similar installations based on these experiences operating both at home and abroad.

Triumph Wheat Developer Dies

OKLAHOMA CITY—Joseph Danne, 72, who won fame as the developer of the nation's No. 1 early maturing wheat, was found dead in h's farm home near El Reno, Okla., Oct. 28. Mr. Danne perfected the Triumph wheat variety during the 1940's and today more than 5½ million acres are seeded annually to the wheat he developed.

Mr. Danne began his experiments as a child on his father's wheat farm near Kingfisher, Okla. Though lacking a formal education, his study of biology and plant experimentation led to his discovery and improvement of a wheat variety that resisted rust, smut and wet and dry weather, and matured earlier than other varieties.

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1959 Pacific Northwest Protein Survey

The following table lists the average levels of protein in 10 selected varieties of the 1959 wheat crop and compares them with those of the last five years. Quality information was furnished by the Pacific Northwest Section of the American Association of Cereal Chemists. This report was based on 2,870 samples tested of the varieties listed. Protein in the Club wheats this year was up slightly from last year, as expected. The quality of Columbia this year has been most encouraging, with the protein up from the last two years. Baking tests on this year's crop look very good.

VARIETY	1959	1958	1957	1956	1955
Turkey types	10.9	10.7	10.8	11.6	10.5
Columbia	12.9	10.8	10.3	...	...
Club types	8.8	8.5	8.4	8.6	9.1
Federation	10.5	11.5	10.4	10.2	10.7
Baart	12.1	11.6	11.2	11.7	12.4
Brevor	8.5	8.2	8.3	9.0	9.5
Idaed	10.9	11.4	10.9	10.8	11.5
Burt	9.7	8.9	10.3	11.3	...
Requa	9.7	9.2	9.1	9.1	9.5
Marfed	11.6	10.5	10.7	10.3	11.0

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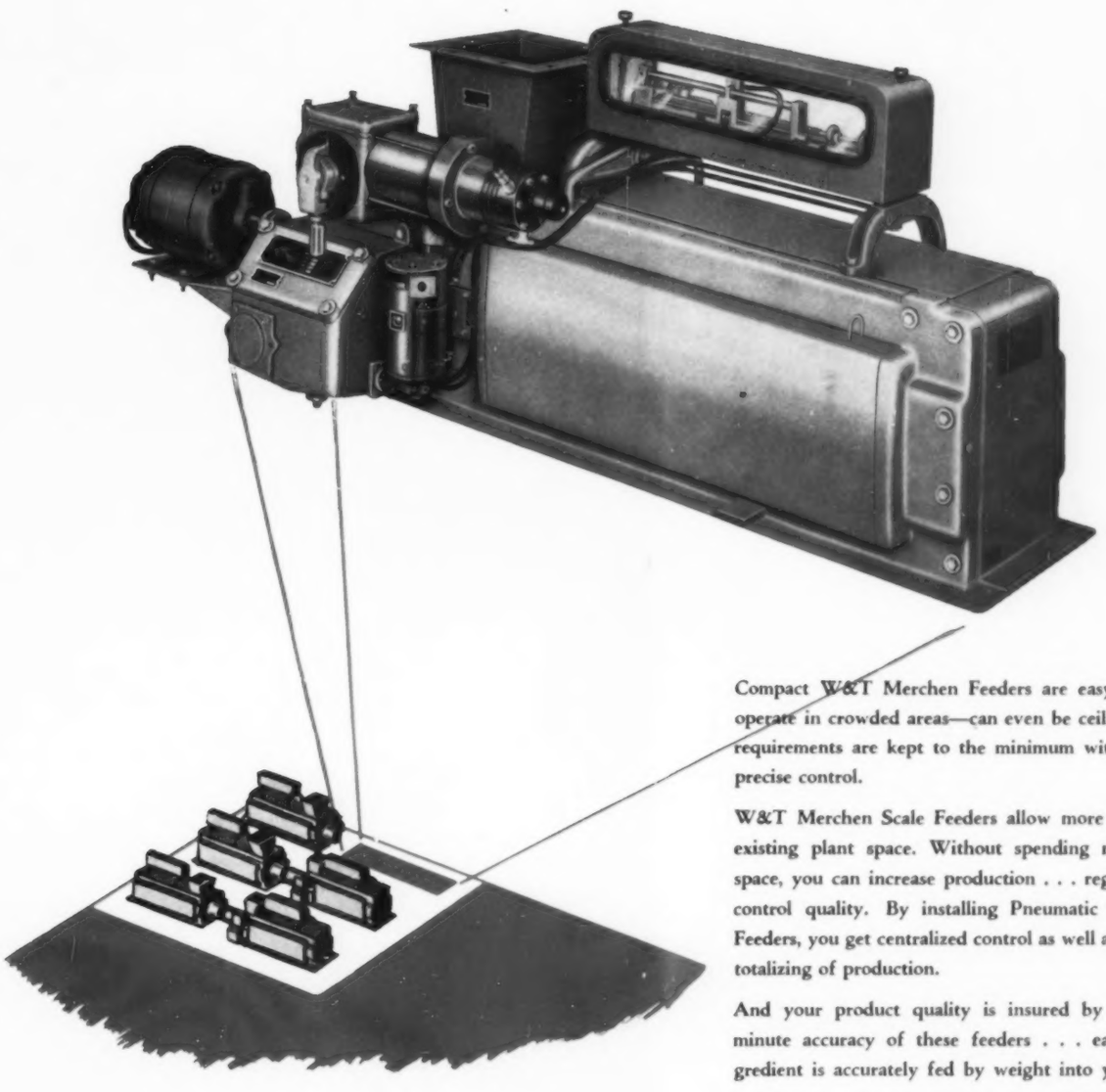

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